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A NUTRITIONAL PROGRAM FOR PROLONGATION OF LIFE IN CORONARY ATHEROSCLEROSIS

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For the past decade, atherosclerosis has no longer been regarded as the inevitable result of age or the "wearing out" of the arteries but rather as a disorder of lipid and/or lipoprotein metabolism.[1] This occurs in young people and is known as a process beginning in early childhood.[2] It is a paradox that with the birth of the infant, the process of aging or death thus sets in. In considering the difficult problem of treatment for atherosclerosis of the coronary arteries in particular, recognition has now come of some six factors that are most frequently incriminated in the development and treatment of the disease. Briefly stated they are: (1) dietary factors; (2) reduction of body weight; (3) certain agents having pharmacological properties, such as lipotropic substances, female sex hormones, anticoagulating agents, and tobacco; (4) anatomic factors of stress and strain at certain points in the arterial walls; (5) hereditary or familial tendencies; and (6) physical exercise and emotional factors. A report follows of over eight years of controlled studies of certain aspects of the first three factors cited above.

DIETARY FAT AS A CAUSE

The incrimination of dietary fat as the cause of human arteriosclerosis or atherosclerosis dates largely from World War I. After the British blockade of Germany during that war it was noted extensively by German pathologists and clinicians that the incidence of deaths and sickness from coronary and cerebral vascular atherosclerosis fell sharply. After that war, with the lifting of the food blockade and the resumption of the customary fat intake in the diet, the incidence of deaths and morbidity from these diseases rose again to prewar levels in Germany.[3] During World War II history repeated itself as regards the relationship of dietary fat and the incidence of coronary and cerebrovascular arteriosclerosis and/or atherosclerosis. This time the various Scandinavian governments supplied the information that, when fat in the diets of the population had to be reduced to a minimum because of the scarcity of dietary fats, the death and sickness rate from atherosclerosis was likewise reduced to a minimum. As soon as the war ended and dietary fat once again became plentiful, the mortality rate and morbidity rates from coronary and cerebrovascular disease promptly soared to prewar levels and even began to surpass them.[4]

More recently, additional information corroborating these findings was obtained from American military studies such as those of Enos [5] and others. As a consequence, numerous investigations began into the role of lipid metabolism in the production of human and animal atherosclerosis.[6] It was well established that atherosclerosis induced by feeding excessive quantities of cholesterol and fats in the diet could easily be produced in rabbits, rats, dogs, and monkeys.[7] Objections to the validity of any concepts about atherosclerosis derived from such studies were numerous due mainly to species differences. Consequently it was decided that human subjects would provide the soundest approach to the question of any relationship between dietary fats and cholesterol in the production of atherosclerosis. This de-

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cision to use human subjects stemmed from the now overwhelming mass of evidence that atherosclerosis was no longer the inevitable result of age or a "wearing out" or "rusting" of the arteries. I have approached this problem as a disorder in lipid or lipoprotein metabolism, which takes its toll of young adults as well as older persons. This view is borne out by the findings of various authors such as Dock,[7a] myself,[8] and others that the atherosclerotic process in the American adult is already well developed when the individual is in his 30's.

STUDY OF DIETARY FAT INTAKE

Accordingly, in 1946, I [9] began the study of 100 patients to determine the relationship of dietary fat intake to the incidence of atherosclerosis. These patients had proved cases of coronary thrombosis with myocardial infarction and had survived their initial attack. This particular disease was selected because it had been demonstrated by various observers [10] that in 90% or more of the patients with coronary thrombosis and myocardial infarction the cause of the disease was atherosclerosis of the coronary arteries. Thus a direct approach to human atherosclerosis was available. The 100 patients described above were divided into two groups of 50 patients each. Each group consisted of unselected patients

Survival Rates in Patients with Coronary Thrombosis and Infarction After Eight Years

No. of Cases	Deaths	Survival
Normal Prethrombosis Diet		
50	38 (76%)	12 (24%)
20-25 Gm. Fat-Cholesterol Intake		
50	22 (44%)	28 (56%)

with proved myocardial infarction who survived their initial attack and whose condition was uncomplicated by other disease such as hypertension, diabetes mellitus, nephritis, thyroid disease, xanthomatosis, or other conditions in which a complicating metabolic disorder was present. The two groups of 50 patients each consisted of a control group in which no dietary restriction of fat was imposed and a treated group in which the dietary fat was restricted from 20 to 25 gm. of fat daily. In both groups any customary medicaments of a supportive character were given when indicated.

After three years of observation of these two groups, I used the criterion of mortality rate only to test the validity of the concept that dietary fat was related directly to the production of atherosclerosis in the human. Mortality rates in these cases appeared to offer final conclusions regarding the arrest or regression of the atherosclerotic process and did not involve objectionable features such as interpretations of subjective symptoms in patients or similar problematical data. At the end of the three year study period [9] it was found that 35 of the 50 patients in the control group survived, 15, or approximately one-third, having died of cardiac disease, mostly recurrent coronary thrombosis. In contrast, 43 of the 50 patients who were dietetically treated (through dietary fat restrictions) survived, 7 of them having died of cardiac disease, mostly coronary thrombosis with myocardial infarction. These cases were too few to be of statistical significance, yet they did suggest that dietary fat restriction directly retarded the progress or development of atherosclerosis of the coronary arteries.

RESULT OF EIGHT YEAR FOLLOW-UP STUDY

Since the above studies were begun in 1946, eight years have elapsed in which the original 100 patients with coronary atherosclerosis have been followed. The original 50 dietetically treated patients and their families were continually supervised as regards adherence to the diet. These patients originally assured their full cooperation; patients who could not be relied upon for complete cooperation were dropped from this study at the outset. Cooperation in adherence to the diet appeared to be assured by the statements of the families involved as well as by the patients themselves. Full cooperation from patients resulted in falls in serum lipid levels and decreases in body weights. In the three-year follow-up of these 50 dietetically treated patients, it was noted that the average fall in weight was 21 lb. (9.5 kg.) for males and 17 lb. (8 kg.) for females. Total serum lipid levels fell from 840 mg. per 100 cc. before treatment to 571 mg. after treatment; total serum cholesterol levels fell from a pretreatment and mean level of 312 mg. to 220 mg. per 100 cc.; and neutral fat fell from 236 mg. to 120 mg. per 100 cc.

After eight years of observation the following number of deaths occurred in both groups of patients as noted in the table. Of the original 50 control patients who had coronary thrombosis and myocardial infarction, only 12 were living; 38 had died mainly of cardiovascular disease. Of the original 50 dietetically treated patients on low-fat, low-cholesterol diets, 28 were living; 22 had died mainly of cardiovascular disease. The mean age for the surviving dietetically treated patients with coronary disease was 68 years and that for the control or nondietetically treated patients was 70 years, the age range for both groups being 40 to 78 years of age. Of the 28 surviving treated patients, 6 were females and 22 were males. Of the 12 surviving control patients, 4 were females and 8 were males.

TYPE OF NUTRITIONAL PROGRAM

As for the diets of both control and dietetically treated groups, as originally noted,[9] the dietary fat content each day for the control group was judged to range from 80 to 160 gm. of fat, with an estimated range of cholesterol intake of from 200 to 1,800 mg. daily. The dietetically treated group consumed an estimated 20 to 25 gm. of fat daily, with a cholesterol intake estimated at 50 to 70 mg. In this group, the caloric intake averaged 1,600 calories comprised of approximately 225 gm. of carbohydrate and 120 gm. of protein. The diet prescribed included a vitamin A content of 9,753 I. U., 2.48 mg. of riboflavin, and 140 mg. of ascorbic acid, all within the normal daily intake limit. In addition, a supplementary vitamin capsule that more than doubled the daily dietary vitamin intake was prescribed to be taken daily. The mineral

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9. Morrison, L. M.: Reduction of Mortality Rate in Coronary Atherosclerosis by a Low Cholesterol-Low Fat Diet, Am. Heart J. **42**: 538, 1951.
10. Morrison, L. M., and Johnson, K. D.: Cholesterol Content of the Coronary Arteries and Blood in Acute Coronary Artery Thrombosis, Am. Heart J. **39**: 31, 1950.

content of the diet was similarly normal, containing approximately 1.009 gm. of calcium, 1.792 gm. of phosphorus, and 0.0222 gm. of iron. In order to provide additional protein in the diet, a natural supply of vitamin B complex, a minimum of 2 oz. (60 gm.) of whole-wheat germ and 8 gm. of powdered, flavored brewer's yeast was prescribed with fruit and skim milk at least once a day. This combination also utilized the well-known therapeutic action of the lipotropic factors contained in choline, inositol, methionine, cyanocobalamin, and vitamin B_6 in the prevention and treatment of atherosclerosis in experimental animals as well as in patients with coronary artery disease.[11] These lipotropic factors are potentiated by the high-protein, low-fat diet.

No significant further changes in weight occurred during eight years for either male or female patients in the treated group after the mean pretreatment weights for males dropped from 166 lb. to 145 lb. (75 to 66 kg.) in the three year reports [9] and the mean pretreatment weights for females dropped from 141 lb. to 124 lb. (64 to 56 kg.) after three years of dietary treatment. The control patients' weights, as originally noted, did not appear to undergo any significant alteration. Medication in both groups of patients was usually similar and, when indicated, consisted of digitalis, aminophylline, glyceryl trinitrate (nitroglycerin), or sedatives, as needed by the patients, depending upon their cardiac condition.

MORTALITY RATES AND CAUSE OF DEATH

As noted in the table, if the mortality rates of both groups are estimated percentagewise, they are as follows: After eight years with no treatment, of the 50 patients in the control group who had coronary disease, 12 survived, a survival rate of 24%. After eight years of dietary treatment, of the 50 patients who had coronary disease, 28 patients survived, a survival rate of 56%, or more than double that of the control patients.

A breakdown of the cause of death in each group of patients after eight years of observation indicated that the mortality rates of the patients with coronary disease in the control group are comparable to those described by various authorities.[12] In the control or nontreated group, of the 38 patients who had died, death was due to cardiovascular disease in 22 cases and to extracardiac diseases, including cerebrovascular, in 8 cases. In eight patients death was due to causes that could not be determined. In the patients treated through the nutritional program, of the 22 patients who had died, death was due to cardiovascular disease in nine cases and to extracardiac diseases in eight cases. In five patients death was due to unknown causes.

OVERWEIGHT AS A FACTOR

A significant factor in the evaluation of results obtained with restricted dietary fat intake in this group of patients is weight reduction. As noted in a previous publication [9] and in this one, a weight loss tantamount to some 15% of total body weight occurred after three years of dieting in the treated group of patients with coronary disease. It was originally pointed out by Hippocrates [13] and more recently by the statistical divisions of various life insurance companies and by numerous authorities [14] that overweight is an important factor in increasing the mortality rate in coronary and cerebrovascular disease. American malnutrition is becoming widespread in the sense that excessive calories are consumed, with an abnormal concentration on carbohydrate and fat intake, and there is loss of essential nutrients from processing refinements and the cooking of foods. As a consequence, "oily dropsy," [14] or overweight, results and prohibits the ideal weight that patients, particularly those with coronary disease, should maintain for their body build at maturity.

After three years of dietary fat restriction, the dietetically treated patients with coronary disease showed no further significant weight loss or gain. For the five years after this stabilization of weight in the treated group of patients, an appreciable difference in the mortality rates between the two groups of patients is apparent and is not further influenced by additional weight loss or gain. It should also be considered that the dietetically treated group of patients at the end of three years approximated ideal or more normal weight levels and so was a more favorable group of patients to treat than the control patients, whose weights were comparatively unaltered through the period of observation.

CORROBORATIVE FINDINGS OF NEW STUDIES

Since the inception of these studies, new information has been collected by various investigators that now directly correlates the relationship of high-fat dietary intake with high mortality rates from degenerative heart disease and vice versa.[14] The recent studies of American and Oriental soldiers in Korea [5] have served to point sharply to the correlation of dietary fat intake and the incidence of coronary atherosclerosis in both American and Oriental soldiers. This may be significantly linked to the startling increase in both coronary atherosclerosis and the fat and caloric content of the American diet. A description of the moderately high-protein, low-fat, low-cholesterol diet utilized in this study is similar to the diet originally prescribed eight years ago at the outset of these studies by me.[15]

It is of interest to note that a frequent observation in the group of patients treated by the nutritional program described here was a sense of optimism, well-being, and good spirits; increased exercise tolerance and increased working capacity, with decrease or disappearance of anginal symptoms, occurred in certain cases. This study suggests the value of similar surveys utilizing larger numbers of cases for statistical evaluation. In this way the incorporation of a nutritional program as described here can be considered for therapeutic or preventive uses in medical practice.

SUMMARY AND CONCLUSIONS

One hundred patients with proved coronary thrombosis and myocardial infarction were observed over an eight year period of time. The patients were divided into

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12. Cole, D. R.; Singian, E. B., and Katz, L. N.: The Long-Term Prognosis Following Myocardial Infarction, and Some Factors Which Affect It, Circulation **9**: 321, 1954.
13. Hippocrates: Medical Works, translated by J. Chadwick and W. N. Mann, Oxford, England, Blackwell Scientific Publications, 1950, p. 154.
14. Footnotes 1a and 5.
15. Morrison, L. M.: Arteriosclerosis: Recent Advances in the Dietary and Medicinal Treatment, J. A. M. A. **145**: 1232 (April 21) 1951.

two groups of 50 patients each. One group was the control group of patients who maintained their prethrombosis diets and weights. The treated group of patients was studied and compared as to survival rate resulting from a nutritional program of a low-fat, low-cholesterol diet that was moderately high in protein, supplemented by certain vitamins, and accompanied by a significant loss in weight. After eight years of observation, of the 50 patients in the control or nontreated group, 12 patients had survived, a survival rate of 24%. Of the 50 patients treated through the above nutritional program, 28 patients had survived, a survival rate of 56%. It was noted that the survival rate of postcoronary patients, i. e., with proved coronary atherosclerosis, on a specific nutritional program was more than 100% greater than that of postcoronary patients in a control group who adhered to the typical American diet.

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USE OF EXTERNAL ELECTRIC PACEMAKER IN CARDIAC ARREST

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and
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Cardiac arrest presents a critical problem in four different types of clinical situations: (1) in Stokes-Adams disease; (2) during reflex vagal stimulation; (3) during treatment with cardioactive drugs; and (4) during various diagnostic and therapeutic procedures, particularly during anesthesia. It requires emergency resuscitation for which the desperate and often ineffective measures of cardiac puncture, intracardiac drugs, and thoracotomy with cardiac massage have been the only therapy heretofore available.[1] We have developed a new therapeutic approach to the problem of cardiac arrest[2]: an externally applied cardiac pacemaker that stimulates the heart electrically, terminates ventricular standstill, and maintains an externally paced ventricular rhythm for as long as necessary. The electric stimulator functions like a natural intracardiac pacemaker but is under complete external control. The instrument is portable, easily applied, and clinically practicable.

STOKES-ADAMS DISEASE

Stokes-Adams disease consists of attacks of cerebral ischemia due to very slow idioventricular rates, ventricular standstill, ventricular tachycardia, or ventricular fibrillation in patients with atrioventricular heart block.[3] The attacks are manifested by dizziness, syncope, prolonged unconsciousness, and convulsions, and they may end in death. The cardiac origin of such seizures becomes clear when circulatory arrest is observed during an attack; the diagnosis of Stokes-Adams disease should be suspected when heart block of any degree is observed between attacks.

We have now resuscitated 27 patients from Stokes-Adams attacks with the electric pacemaker. Attacks due to very slow idioventricular rates were observed in 8 patients and to ventricular standstill in 24 patients; these episodes of cerebral ischemia were all terminated immediately by electric stimulation. This dramatic effect was observed countless times. Stokes-Adams attacks due to ventricular tachycardia or fibrillation were seen in 14 patients; none of these was stopped by stimulation. In five patients, however, with frequent attacks due to multifocal ventricular tachycardia or fibrillation, continued external stimulation prevented their recurrence. Stimulation was continued after resuscitation in 22 of the patients for periods as long as 109 hours. Continued stimulation was necessary in them to maintain effective circulation, because of persistent absence of spontaneous ventricular beats or because of recurrent ectopic ventricular activity.

The figure shows electrocardiograms from one of these patients and demonstrates effective external stimulation of the heart. The intensity of the electric stimuli (E) was progressively increased until ventricular responses (V) were produced (figure, *A*). Three spontaneous idioventricular complexes (cycle length 2.04 seconds) are seen during ineffective stimulation; during effective stimulation at a faster rate (cycle length 1.11 seconds), they are suppressed. When stimulation was stopped, the spontaneous ventricular pacemaker reappeared after a pause of 4.64 seconds and regained its previous rate within three beats (figure, *B*). Each stimulus (E) produced a ventricular response (V). Each electrocardiographic ventricular response depended upon an electric stimulus as shown by the constant relationship at widely varying rates of stimulation (figure, *C*). During a test period of 5.5 seconds, no stimuli were applied (figure, *D*). No spontaneous ventricular contractions oc-

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The discussion of this paper was opened by Drs. Harold N. Segall, Montreal, Canada, and Albert H. Douglas, Jamaica, N. Y.

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Trainee, National Heart Institute (Dr. Paul) and Research Fellow, American Heart Association (Dr. Gibson).

The cardiac pacemaker used in this study was manufactured by Electrodyne Co., Norwood, Mass.

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curred during this interval, and the patient lost consciousness. The independent atrial rhythm continued. Resumption of stimuli immediately gave ventricular responses, and the patient revived at once.

The patient was a 71-year-old woman who usually showed complete atrioventricular block, but partial block and normal sinus rhythm were occasionally observed. She suffered frequent and severe syncopal attacks, usually due to ventricular standstill but occasionally due to bursts of ventricular fibrillation. On eight occasions in two months, prolonged stimulation for periods ranging from 6 to 48 hours was necessary to maintain adequate circulation until a spontaneous sustained idioventricular pacemaker reappeared. The intervals of stable rhythms between these periods of stimulation varied from two hours to 19 days. She has now survived for 22 months since the initial resuscitation by the cardiac pacemaker. Her present condition is satisfactory, and she shows no deleterious effects on her mental or cardiac function as a result of either the prolonged stimulation or the syncope. She has had no attacks for 20 months.

In the 27 patients with Stokes-Adams disease resuscitated with the external electric pacemaker, survival is dated from the time that spontaneous ventricular activity returned after the first therapeutic application of stimulation, whether it was used briefly for resuscitation or continuously for maintenance of circulation. Ten patients, four of whom are still alive, survived 1 to 29 months. Duration of stimulation for these patients varied from a few seconds to 109 hours. Of the remaining 17 patients, in whom duration of stimulation was a few seconds to 108 hours, 8 survived 1½ to 16 days, 5 survived 1 to 11 hours, and 4 did not survive the initial period of stimulation.

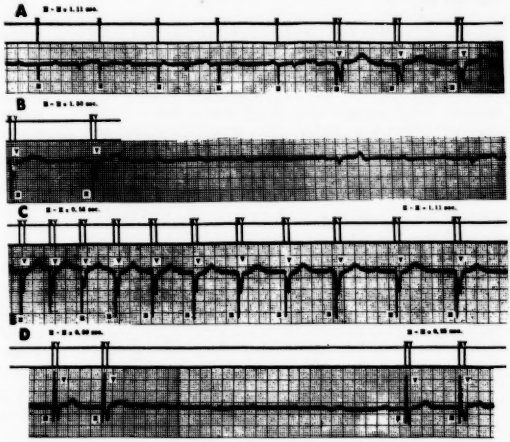
Twenty-three patients are now dead. Eighteen died of Stokes-Adams attacks because the electric pacemaker was not applied during the fatal attack, because the attack was due to ventricular tachycardia or fibrillation, or because of irreversible cerebral damage due to cardiac arrest before electric stimulation was applied. The remaining five patients died of cardiac tamponade from multiple cardiac punctures, of acute myocardial infarction, of acute bacterial endocarditis, and suddenly after a 10 month interval without syncope.

On the basis of these experiences we have formulated a program for the treatment of a patient with Stokes-Adams attacks. If the patient is seen during a seizure, the external electric pacemaker should be applied at once. If it is not immediately available, one should slap the chest, then puncture the heart with a needle, and finally inject epinephrine into a cardiac chamber. After resuscitation, if sustained, adequate, spontaneous ventricular activity does not reappear, the patient may be kept alive by the external pacemaker. This external stimulation must be continued until intrinsic ventricular activity reappears spontaneously or is aroused by drugs like epinephrine, given preferably by controlled intravenous infusion beginning at 4 mcg. per minute. To maintain blood pressure, arterenol should be given.

The prevention of recurring Stokes-Adams attacks is a third major problem. When the idioventricular rate is too slow (below 30 per minute), ephedrine sulfate and isopropylarterenol are often useful for long-term maintenance of heart rates between 30 and 45 beats per minute. When they are due to varying atrioventricular conduction, atropine and ephedrine should be tried. When the attacks are due to recurrent ventricular tachycardia or fibrillation, ephedrine again may reduce ectopic activity by increasing the basic ventricular rate; quinidine and procainamide are contraindicated in these patients.

REFLEX VAGAL ARREST

Episodes of cerebral ischemia due to ventricular standstill or fibrillation also occur in patients without Stokes-Adams disease. Certain of these episodes, as in the carotid sinus syndrome, are usually transitory and



Lead aVF; standardization half-normal (1 mv. equals 5 mm.). *A*, interruption of idioventricular rhythm by faster externally paced beats; *B*, resumption of idioventricular rhythm after external stimulation; *C*, effective stimulation at varying rates; *D*, ventricular standstill during temporary interruption of stimulation.

are clearly due to reflex vagal stimulation. The distinction between Stokes-Adams disease and reflex vagal standstill is of clinical importance because of differences in the course, prognosis, and treatment of each condition. This distinction ultimately depends upon the presence or absence of atrioventricular block between attacks.[3]

External electric stimulation was effective repeatedly in resuscitating three patients with ventricular standstill due to reflex vagal stimulation. In all three, episodes of complete heart block and ventricular arrest repeatedly interrupted normal sinus rhythm abruptly, producing syncope and convulsions. The precipitation of such episodes by carotid sinus pressure and their disappearance after the administration of atropine sulfate established their reflex vagal origin. More than 100 times, in these patients, external electric stimulation terminated ventricular standstill and restored an effective circulation.

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STANDSTILL DUE TO DRUG INTOXICATION

A third type of cardiac arrest occurs as a result of depression of cardiac rhythmicity due to drug intoxication. We have observed two patients with attacks of syncope due to digitalis. With the occurrence of sinoatrial block, cardiac activity was maintained by atrioventricular nodal or ventricular pacemakers; intermittent failure of these pacemakers resulted in periods of ventricular standstill lasting as long as one minute. External electric stimulation resuscitated the patients immediately several times. With recession of digitalis effect, seizures stopped. Two patients with ventricular standstill after intravenous administration of procainamide in the treatment of ventricular extrasystoles and tachycardia were also resuscitated promptly by the external electric pacemaker.[4] Experimentally we have observed that the electric pacemaker also produces effective beats during marked cardiac slowing due to quinidine.

UNEXPECTED CIRCULATORY ARREST

In addition to patients with Stokes-Adams disease and reflex vagal standstill, circulatory arrest may also occur in a third group of patients. Young, healthy individuals without heart disease may develop circulatory arrest unexpectedly, while undergoing various diagnostic and therapeutic procedures, particularly under anesthesia. Though infrequent, each such accident is a dreadful catastrophe. The commonly recognized mechanisms of unexpected circulatory arrest are ventricular standstill or fibrillation; standstill is the usual cause (88% according to Stephenson and co-workers[5]). Reflex vagal stimulation appears to be a frequent precipitating factor.[5]

Electric stimulation has been effective in a number of cases of unexpected circulatory arrest. In two cases of ventricular standstill associated with cardiac surgery, one observed by us[7] and one reported by Bailey and co-workers,[6] effective ventricular beats were produced by external or direct stimulation; despite this temporary cardiac resuscitation, however, both patients died because of unsuccessful cardiac surgery. Three other patients recovered completely after external electric cardiac resuscitation. Darsie and Dammann[7] reported a patient who, after cardiac surgery, developed complete heart block with a slow idioventricular rhythm and then persistent ventricular standstill. External stimulation was necessary for 63 hours to maintain an adequate circulation; normal atrioventricular conduction then returned and the patient recovered completely. In a second patient, reported by Douglas,[8] circulatory arrest occurred suddenly during a pericardicentesis; within 2 minutes external electric stimulation was applied and resuscitated the patient promptly. The third patient was reported to us by Davis.[9] Cardiac arrest occurred unexpectedly at the end of a long abdominal exploration. External electric stimulation of the heart was applied after 2½ minutes of arrest and resuscitated the patient promptly. Standstill recurred three times in the next two hours; each time the electric pacemaker restarted the heart promptly and the patient recovered completely.

We attempted resuscitation with the cardiac pacemaker unsuccessfully (after delays of a few minutes to two hours) in eight patients who developed circulatory arrest unexpectedly during jugular puncture, intravenous pyelography, bronchography, endotracheal intubation, cardiac catheterization, cholecystectomy, hip-nailing, and cardiac surgery. These failures show that the problem of unexpected circulatory arrest is twofold. First, effective ventricular beats cannot be stimulated during ventricular fibrillation. Second, the responsiveness of the heart to stimulation diminishes progressively with continued anoxia. The time interval between circulatory arrest and the resumption of effective ventricular output must be brief, probably less than 3 or 4 minutes, if cerebral and cardiac function is to return unimpaired. Avoidance of excessive delay depends upon immediate recognition of the circulatory arrest and immediate institution of a prearranged program for resuscitation.

TREATMENT OF UNEXPECTED CIRCULATORY ARREST

Crucial delay in recognizing the onset of arrest would be avoided by a practical monitoring device to signal immediately the cessation of circulation. Ideally, such an alarm system should be simple and cheap enough to allow its routine application to all patients during anesthesia. Time is so vital after the onset of circulatory arrest that the anesthetist should announce its passage at 10 or 15 second intervals until circulation has been restored.

Since ventricular standstill is the more frequent cause of circulatory arrest, treatment for standstill should be instituted immediately unless the mechanism is known to be fibrillation. Although electrocardiographic identification of the cardiac mechanism is useful, treatment should not be delayed to obtain a tracing but external electric cardiac stimulation should be applied at once. While awaiting the electric pacemaker, one should stimulate the heart mechanically by slapping the precordium forcefully, by cardiac needle puncture, or by cardiac massage through the diaphragm when the abdomen is open. These measures are simple and immediately available but are frequently ineffective. If the electric pacemaker is close at hand and if the personnel are familiar with its use, it can be applied within 30 to 40 seconds. Auxiliary measures such as artificial respiration with oxygen, blood transfusion, and vasodepressor drugs may be necessary to maintain an adequate blood flow.

If the initial mechanism is ventricular fibrillation, or if the cardiac pacemaker fails to resuscitate the patient within one minute from the onset of arrest, the chest must be opened promptly and the heart massaged. If ventricular fibrillation persists in spite of effective massage, defibrillation should be attempted. Drugs, such as potassium chloride, procaine, or procainamide, may

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5. Stephenson, H. E., Jr.; Reid, L. C., and Hinton, J. W.: Some Common Denominators in 1200 Cases of Cardiac Arrest, Ann. Surg. **137**: 731, 1953.

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8. Douglas, A. H.: Personal communication to the authors.

9. Davis, F. E.: Personal communication to the authors.

be injected into the heart, or countershock (60 cycle A. C., 120 to 150 volts, 0.1 second) may be applied across large electrodes on the heart.

Ventricular standstill may persist despite effective massage, may recur after massage, or may follow defibrillation; the electric pacemaker may then be applied directly to the heart and epinephrine hydrochloride (0.1 to 0.5 ml. of 1:1,000 aqueous solution) may be injected into the left atrial or left ventricular cavity. If resuscitation is successful, the patient must be under constant observation for two or three days, because arrest may recur. A monitor of the cardiac activity should be used to signal immediately the cessation of circulation, and the electric pacemaker should be attached and ready for instant use.

SUMMARY

A method of external electric stimulation has been developed that will arouse the heart from ventricular standstill and will maintain effective, externally paced beats for as long as necessary. It has been used successfully in the treatment of cardiac arrest occurring in Stokes-Adams disease, during reflex vagal stimulation, during treatment with cardioactive drugs, and during various diagnostic and therapeutic procedures.

ADDENDUM

Since submission of this paper, four additional patients have been resuscitated successfully from unexpected cardiac arrest.

330 Brookline Ave. (15) (Dr. Zoll).

TREATMENT OF ACUTE INFECTIOUS HEPATITIS IN THE ARMED FORCES

ADVANTAGES OF AD LIB. BED REST AND EARLY RECONDITIONING

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Prior to World War II, the treatment of acute infectious hepatitis, or catarrhal jaundice as it was then frequently called, was the same as for other viral diseases: rest was prescribed during the acute phase but not enforced after the patient felt well and jaundice had begun to subside. During World War II, it was noted that relapses seemed to be associated with early ambulation, and, in addition, in three controlled studies [1] it was shown that patients treated with a high-protein diet and strict bed rest had a shorter duration of hospitalization than those on a regimen of ad lib. rest and ad lib. diet. Emphasis was placed on an exercise tolerance test as a means of detecting harmful residual activity of the disease.[2]

As a result of these studies, there has been general agreement for the last 10 years that rest in bed should be strict and should be continued as long as the patient has symptoms, or a tender, enlarged liver, or the liver function tests are abnormal. As a direct consequence of these ideas, the average duration of hospitalization of military personnel with infectious hepatitis increased from an average of 30 days during World War II to 60 days in the period just before the Korean war.[3] The average patient was disabled for a week before hospitalization and required two to three weeks of reconditioning before he could return to duty. Thus, the total duration of disability surpassed 80 days.

This drain on military manpower, along with more recent observations [4] suggesting that strict bed rest might not be as essential as heretofore thought, emphasized the need for a controlled study to determine the safety of a more liberal regimen of rest and less prolonged hospitalization. The recent epidemic of viral hepatitis among American military personnel serving in the Far Eastern Theater of Operations and the establishment in 1950 of a hepatitis treatment center at the United States Army Hospital, Kyoto, Japan, afforded an excellent opportunity to reinvestigate the effects of rest and diet on the course of the disease. The present report is a summary of studies conducted under the auspices of the commission on liver disease of the Armed Forces Epidemiologi-

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Read before the Section on Military Medicine at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 7, 1955.

This investigation was sponsored by the Commission on Liver Disease, Armed Forces Epidemiological Board, and was supported by a grant from the Office of the Surgeon General, U. S. Army, Washington, D. C.

The discussion of this paper was opened by Drs. W. Paul Havens Jr. and Lester J. Pope.

1. (*a*) Barker, M. H.; Capps, R. B., and Allen, F. W.: Acute Infectious Hepatitis in the Mediterranean Theater, Including Acute Hepatitis Without Jaundice, J. A. M. A. **128**: 997 (Aug. 4) 1945. (*b*) Hoagland, C. L., and Shank, R. E.: Infectious Hepatitis: A Review of 200 Cases, ibid. **130**: 615 (March 9) 1946. (*c*) Hughes, J. D.: Treatment of Infectious Hepatitis by Diet and Rest, Bull. U. S. Army M. Dept. **41**: 662, 1945.

2. Capps, R. B., and Barker, M. H.: The Management of Infectious Hepatitis, Ann. Int. Med. **26**: 405, 1947.

3. Swift, W. E., Jr., and others: Symposium on Viral Hepatitis: Clinical Course of Viral Hepatitis and the Effect of Exercise During Convalescence, Am. J. Med. **8**: 614, 1950.

4. Colbert, J. W., Jr.: Effect of Exercise Simulating Field Duty upon Hepatitis Patients with Abnormal Bromsulphalein Dye Retention, report submitted to the Office of The Surgeon General of the Army, May 10, 1951. Klatskin, G., and Rappaport, E. M.: Late Residuals in Presumably Cured Acute Infectious Hepatitis, Ann. Int. Med. **26**: 13, 1947. Swift.[3]

cal Board. A detailed presentation of the design and results has been published elsewhere.[5]

EXPERIMENTAL DESIGN AND METHODS

Patients were admitted to one of the treatment groups by a system of randomization designed so that the medical officer admitting a patient to the study did not know at the time of acceptance what treatment the patient was

Results of Treatment of Patients with Acute Infectious Hepatitis

	First Study		Second Study	
Bed Rest / Reconditioning	Strict / Delayed	Ad Lib. / Delayed	Ad Lib. / Early	Ad Lib. / Delayed
Total patients	126	127	95	94
Duration of acute illness, days	30	28	34	28
Patients with early sulfobromophthalein relapses, %	8	6	2	5
Duration of hospitalization, days*	64	63	51	47
Total patients given complete follow-up examination	46	49	40	41
Follow-up examination findings				
Significant symptoms, %	10	12	2	2
Palpable livers, %	12	12	23	19
Liver tenderness, %	12	14	19	0
Abnormal				
Serum bilirubin, %	0	6	0	7
Sulfobromophthalein retention, %†	2	6	7	5
Thymol turbidity, %	2	8	5	5
"Abnormal" patients at time of follow-up, %‡	13	16	10	5
Rehospitalized after discharge, %§	11	6	2	0

* Including time at reconditioning center.

† All abnormal sulfobromophthalein retentions were between 5 and 10%.

‡ "Abnormal" patients were determined by a point score system set up before the study. Thus each category of abnormality, including symptoms, individual physical signs, and liver function tests, was given 1 or 2 points according to clinical significance, and patients with 3 or more points were termed "abnormal."

§ For complaints possibly but not necessarily related to previous hepatitis. No patients had known relapses with jaundice.

to receive. The 126 patients admitted to the two strict bed rest wards were required to stay in bed at all times, except for one trip to the bathroom per day and a shower twice a week. Verification of adherence to this schedule was provided by inspection of the ward four to six times daily, at irregular intervals, throughout the period of hospitalization. On the two ad lib. rest wards no effort was made to control the activity of the 127 patients, except that they were required to remain on the ward and to rest in bed for one hour after each meal. They were, however, allowed to remain in bed if they felt sick. The degree of activity indulged in was recorded each day.

In a second study all patients were treated with ad lib. rest, while varying dietary regimens were being compared. In a group of 95 patients, who were assigned at random on admission, strenuous physical reconditioning was started as soon as the total serum bilirubin level was 1.5 mg. per 100 ml. or below and the sulfobromophthalein retention 5% or less in 45 minutes. Ninety-four had delayed reconditioning and remained in the hospital an additional eight days as controls. The early group received an extra week of reconditioning so that the total observation period would be the same for each group.

5. Chalmers, T. C., and others: The Treatment of Acute Infectious Hepatitis: Controlled Studies of Effects of Diet, Rest, and Physical Reconditioning on Acute Course of Disease and on Incidence of Relapses and Residual Abnormalities, J. Clin. Invest. 34: 1163, 1955.

Clinical examinations and liver function tests were performed on all patients twice a week. The sulfobromophthalein test, with 5 mg. administered per kilogram of body weight, was performed once weekly from the time the total serum bilirubin level was 1.5 mg. per 100 ml. or under until the patient's discharge to duty.

One hundred of the 253 patients in the first study and 88 of the 189 in the second were selected at random for follow-up examinations from 4 to 18 months after return to duty (averages 12 and 8 months respectively). Information consisting of data gathered from a careful medical history and physical examination, usually by one of us, and from the performance of liver function tests, including that for sulfobromophthalein retention, was obtained on 176 of the 188 (94%), and incomplete data were obtained on an additional 7 patients (3%). One of us (C. W. S.) examined 29 former patients at Sasebo, Japan, while they were on their way back to the United States from Korea. One hundred forty were seen by three of us (J. G. C., N. D., and R. W. R.) after return to their homes or new assignments in the U. S. Specimens of serum from these and 10 others examined by cooperating doctors were sent to the research laboratory in Boston for analysis. Four of the patients were examined at the Army hepatitis center in Germany.

RESULTS

Two hundred fifty-three patients were included in the first study. Since there was no demonstrable interrelationship between the effects of rest and diet, for this report the patients on the two ad lib. rest wards were combined for comparison with those on the two strict bed rest wards. The results are summarized in the table. The duration of the acute illness, defined as the time from admission to findings of a total serum bilirubin level of

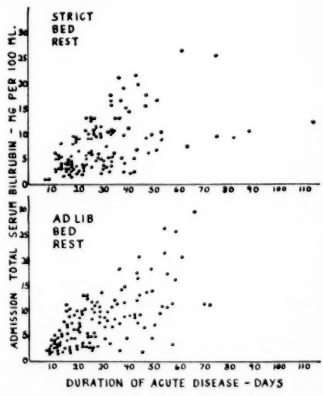

Fig. 1.—The relation of level of total serum bilirubin found on admission for treatment of acute infectious hepatitis to duration of acute illness in each treatment group.

1.5 mg. per 100 ml. or less and a sulfobromophthalein retention of 5% or less in 45 minutes, was essentially the same for the two groups. The relation of duration of illness (treatment effect) to the height of the initial level of serum bilirubin is shown in figure 1. The findings in

the two groups were similar. There was no difference between the treatment groups in the rate of fall of the serum bilirubin level or in the rate of the disappearance of symptoms and signs of the disease. In particular, there was no evidence that ad lib. rest resulted in prolongation of hepatic tenderness or enlargement (fig. 2). Flocculation and thymol turbidity tests were the same in the two groups. During the convalescent period, an equal percentage of each group had a return of abnor-

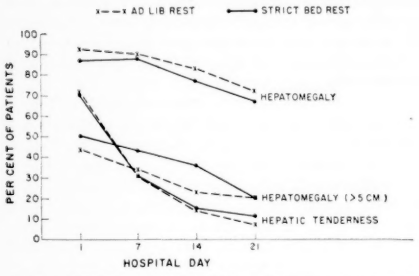

Fig. 2.—Frequency of liver enlargement and tenderness in first study of treatment of patients with acute infectious hepatitis.

mal sulfobromophthalein retention lasting an average of 32 days and unaccompanied by symptoms or jaundice. In the follow-up study it was found that 5 of the 46 patients treated with strict bed rest and 3 of the 49 patients treated with ad lib. rest had been hospitalized for more than one day for symptoms and findings possibly related to their previous acute hepatitis. No case of recurrent jaundice was seen. The occurrence of symptoms after discharge to duty was equal in the two groups (fig. 3). An approximately equal number in each group on follow-up examination were found to have residual abnormalities in the realms of symptoms, signs, and liver function tests, most of which were considered to be minor in importance.

In the second study, 95 patients subjected to early strenuous exertion at a physical reconditioning center revealed minor rises in level of total serum bilirubin and sulfobromophthalein following tests, as well as an increased occurrence of symptoms and nontender hepatomegaly during the first week of reconditioning when compared with the control group of 94 patients kept in the hospital. Although statistically significant, these changes were not considered to be of clinical significance because they were small, they disappeared in spite of continued exercise, they were seldom combined in the same patient, and they were not accompanied by unequivocal residual abnormalities in the follow-up study. Recurrent clinical jaundice was never seen after exercise. During the interval following discharge, only one of the patients included in the follow-up examination was hospitalized for a possible recurrence without jaundice. During the interval more of the patients with early reconditioning had vague right upper quadrant pains (fig. 3), and significantly more on follow-up examination had tender livers (see table). In view of lack of significant disability or other more objective abnormalities, clinical significance of these findings is unknown.

COMMENT

Thus, the previous belief that bed rest should be enforced after a patient feels well enough to be up and around his hospital ward has not been confirmed by the studies briefly summarized above. Likewise, no definitely deleterious effects of strenuous exercise early in convalescence have been demonstrated. Before recommendations can be made for a distinct change in the routine treatment of hepatitis, it is necessary to consider possible explanations for the discrepancies between data of previous and present studies. One or more of the following three factors may be operative: (1) inadequacies or misinterpretations of the present study, (2) a distinct change in the disease or clinical material, or (3) inadequacies or misinterpretations of past studies.

Except for the fact that it was impossible to rotate the patients among wards and to rotate the doctors among treatment groups, thus controlling unknown ward and doctor "effects," the studies reported above were well controlled. Analysis of 34 variables other than treatment that might have influenced the results revealed the groups of patients in the first study to be entirely similar. Thus, there was no evidence that the patients on the strict bed rest regimen were by chance more severely ill. On numerous daily "bed checks," no more than 10% of these patients were caught out of bed more than the allowed amount. In contrast, after the first few days of hospitalization none of the ad lib. rest patients spent all day in bed, and by the seventh day more than 50% of

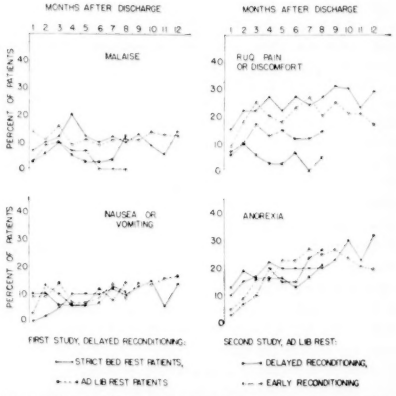

Fig. 3.—History, obtained at follow-up examinations, of symptoms during each month after patient's discharge from hospital. The rise in rates is probably the result of the better memory of the patients for recent complaints.

the patients were out of bed more than 50% of each day. Most of these patients were still jaundiced. Thus, the fact that the two groups of patients received distinctly different treatment was well documented. The number of patients was large enough to make it extremely unlikely that a real difference in favor of strict bed rest could by chance have been undetected. Finally, the follow-up study was adequate in terms of percentage of selected patients contacted.

A comparison of the occurrence of symptoms, depth and duration of jaundice, and mortality reported in this epidemic and in previous epidemics of infectious hepatitis among military personnel [5] revealed no differences sufficient to explain the lack of effectiveness of bed rest in this epidemic. It is possible that more of the patients studied during World War II had homologous serum jaundice rather than infectious hepatitis, but this would seem to be an unlikely explanation of the enigma. The only striking difference lies in the incidence of relapses with jaundice. The 5% incidence encountered in patients studied in Italy during World War II [1a] may have been a manifestation of a more severe disease or may have represented reinfection accompanying the administration of plasma to the more severely ill patients. There is no doubt that the soldiers who were infected with hepatitis in Korea were less battle weary and better fed than those hospitalized in Italy at the height of the fighting in World War II. It is possible but has not been demonstrated [6] that depleted soldiers may have a more serious illness requiring more "conservative" treatment.

The most likely explanation for the discrepancies between our studies and past ones seems to lie in interpretations of the studies on which the conclusions about the essentiality of bed rest were based. In the three studies referred to above,[1] the effects of rest and diet were not differentiated, and the entire beneficial effect may have been due to diet. In addition, other factors that might have influenced the course were not strictly controlled, and the criteria for treatment effect were the durations of hospitalization rather than the more objective liver function test criteria employed in the present studies. Finally, fluctuations of clinical and laboratory tests occurring after ambulation, previously presented as data confirming the efficacy of bed rest, cannot be attributed to the ambulation without control data. In the study reported herein, minor fluctuations occurred at the time of ambulation of the patients on a regimen of bed rest with the same frequency as in the patients who had been up and around throughout the acute period of their disease.

The observation at the Army hepatitis center in postwar Germany that exercise had an adverse effect only in the patients whose serum bilirubin levels were above 3 mg. per 100 ml.[3] confirms the World War II experience that the forced exercising of jaundiced patients was accompanied by a high relapse rate. In the present studies no jaundiced patients were forced to exercise. The changes associated with early reconditioning in the second study and the persistence of hepatic tenderness in those patients suggest that there may be an association between strenuous exertion early in convalescence and liver function, but the clinical importance of this association seems minimal.

It should be emphasized that in these studies the ad lib. rest regimen was not started until an average of 10 days after the onset of symptoms. The patients were never forced to stay out of bed or to perform any ward duties and were confined to their hospital wards. The study offers no evidence, therefore, that rest is not advantageous in the earliest stages of the disease or when the patient feels sick. Unless these points are kept in mind, there will be some unfortunate misinterpretation of the conclusion that strict bed rest need not be enforced after the patient feels well.

The advantages of a regimen of ad lib. rest are obvious. Enforced bed rest may in itself be a debilitating disease with a discouragingly prolonged and symptomatic convalescence. It may be complicated, at least among older patients, by serious vascular accidents, renal lithiasis, osteoporosis, bed sores, or infection. From the military standpoint, the elimination of enforced bed rest and the resultant earlier return to full activity, demonstrated by the present studies to be safe procedures, will result in substantial savings in manpower and the expense of hospitalization.

SUMMARY AND CONCLUSIONS

A carefully controlled study of the effects of strict bed rest in the treatment of acute infectious hepatitis has failed to confirm its advantages after the earliest stages of the disease. It was found that patients treated with ad lib. rest could be started on physical reconditioning programs much earlier because they were not afflicted with the debilitating effects of prolonged rest in bed and did not require a convalescent period of gradually increasing ambulation.

On the basis of the experiences summarized above the following principles of treatment are suggested: 1. A patient with acute infectious hepatitis should be confined to his hospital ward or home and encouraged to stay in bed if he feels sick, but he need not be confined to bed if he feels like getting up, except for an hour's rest after each meal. 2. The level of serum bilirubin concentration should be checked at convenient intervals until it drops below 1.5 mg. per 100 ml. If the sulfobromophthalein retention determined at this time is 5% or less in 45 minutes, the patient may begin to resume normal activity but should have the bilirubin level determined and sulfobromophthalein test repeated after two to four weeks. 3. If the sulfobromophthalein retention stabilizes at between 5 and 10%, the patient may be discharged with safety. Those patients with persistently higher levels of retention or with fluctuating total serum bilirubin levels will require individual management. Liver biopsy may be indicated in the evaluation of these patients. 4. Recurrent abnormalities of the liver function tests will occasionally occur after return to normal activity and may be sufficient reason for reconfinement of the patient.

170 Morton St., Boston 30 (Dr. Chalmers).

6. McFarlan, A. M.: The Epidemiology of Infective Hepatitis in Some Units of the British Army in Sicily and Great Britain, 1943-4, Quart. J. Med. **14**: 125, 1945.

Chloramphenicol.—The discovery of chloramphenicol (Chloromycetin) by Burkholder in 1947 established the fact that an antibiotic effective against a wide variety of microorganisms could be produced by microorganisms isolated from natural sources. Such substances are now known as "broad spectrum" antibiotics. Chloramphenicol was originally obtained from a soil sample collected in a field in Venezuela and from a similar organism isolated from a compost soil in Illinois. The original microorganism was named Streptomyces venezuelae. However, other strains of actinomycete also produce the antibiotic.—P. P. Regna, Ph.D., Chemistry of Antibiotics of Clinical Importance, *The American Journal of Medicine*, May, 1955.

EDUCATIONAL NEEDS—ANESTHESIOLOGIST'S RESPONSE

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The development of the field of anesthesiology in the past two decades is built upon the cornerstone hewn by such men as Waters, Lundy, Guedel, Bourne, Griffith, and Leigh. This growth gained a new impetus after World War II that added strength, an expansion of services, and a promise in the field of anesthesia to fulfill the ideals of organized medicine and to meet the demands of a new concept in patient care. Basic knowledge in this field has expanded to cover a wider range of subjects and skills from an era when it consisted almost exclusively of the technical ability to render a patient insensitive to pain. Now, the versatility of the present-day anesthesiologist is utilized in many ways other than administering anesthetics. Today, through his knowledge of the basic sciences, the anesthesiologist is also a clinical physiologist and pharmacologist.[1]

When we think of the long period involved in the laying of this foundation of present-day anesthesia, our thoughts drift from that Spanish physician who discovered a drug now known as ether to Crawford Long and William Morton. Progress remained very slow for a long time, probably because of the many problems that existed in the over-all picture of medicine. Now many have entered this field having recognized the importance and quality of the intellectual challenge and are building a structure of improved care with greater safety to our patients.

ADVANCEMENT OF EDUCATION AND RESEARCH FACILITIES

During this early period of medical development with its complex problems, the American Medical Association was conceived and founded upon certain basic principles—one of which was the advancement of education and research facilities. The need to encourage, nurture, and stimulate those ideals in well-founded institutions was only a part of the program; the need to point out and to abolish the diploma mill was also most flagrant. The results of this effort are gratifying—undergraduate and graduate medical education have been elevated to a plane that is mandatory of a progressive attitude. The report of a two and one-half year survey of postgraduate medical education by the Council on Medical Education and Hospitals was published in THE JOURNAL.[2] This report is not only quite complete and informative but most pleasing regarding educational facilities and accomplishments in the United States today.

The American hospital administrators, because of their feeling of a moral and legal responsibility for the quality of medical care in their hospitals, are concerned that the practice of medicine be carried out properly, and they realize that this responsibility requires understanding, education, and proper organization. They also feel that many problems must be considered from the viewpoint of the medical profession for good patient care. The American Medical Association and the various American boards have set up standards that assure us of adequate postgraduate training programs. At the present time there are 185 residency training programs in anesthesiology with 746 residents in the United States receiving training under these standards.[3] The growth of this program has been great. With this growth in research and knowledge, and a better understanding of preoperative and postoperative care, many operations can now be performed that before would have been considered impossible or too serious a surgical risk. Modern anesthesia has removed this limiting factor in the surgeon's work. Research and knowledge in anesthesia have been developed more rapidly than their application could be transferred to the patient in the operating room. A quality of anesthesia care equal to the quality of surgical care is lacking in too many localities. This critical shortage of adequate anesthesia care has been discussed at conferences of hospital administrators throughout the country. These individuals fully realize the trend for the general practitioner to locate near large medical centers that have already attracted our trained men in a limited field of practice. The hospital associations are requesting assistance in solving this problem of adequate anesthesia coverage for the smaller institutions. They have also suggested a liaison committee with the American Society of Anesthesiologists and the American Hospital Association in order to clarify the relationship of the specialty with the hospital administration, which we of this group must encourage.

In reviewing the recent survey of the American Society of Anesthesiologists it is noted that the part-time anesthesiologist, who is the general practitioner, is administering a large percentage of anesthesia throughout the United States. This is particularly true in the rural and sparsely populated areas that have benefited under the Hill-Burton act. In many instances he is placed in this position by necessity rather than desire and because of this has requested educational assistance. This physician with a small amount of academic instruction is a safer administrator of anesthetics than is the technician

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Chairman's address, read before the Section on Anesthesiology at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 10, 1955.

1. Need for Anesthesiologists, editorial, J. A. M. A. **145**: 906 (March 24) 1951.

2. Vollan, D. D.: (*a*) Scope and Extent of Postgraduate Medical Education in the United States, J. A. M. A. **157**: 703-708 (Feb. 26) 1955; (*b*) The Physician as a Lifelong Student, ibid. **157**: 912-920 (March 12) 1955; (*c*) Objectives and Content of Postgraduate Medical Education, ibid. **157**: 1119-1125 (March 26) 1955; (*d*) Educational Methods in Postgraduate Teaching, ibid. **157**: 1302-1309 (April 9) 1955; (*e*) Time and Place Arrangements of Postgraduate Courses for Practicing Physicians, ibid. **157**: 1492-1498 (April 23) 1955; (*f*) Sponsorship and Administration of Postgraduate Medical Education, ibid. **158**: 39-43 (May 7) 1955; (*g*) Financing Postgraduate Medical Education, ibid. **158**: 184-187 (May 21) 1955; (*h*) Future of Postgraduate Medical Education, ibid. **158**: 395-399 (June 4) 1955.

3. Approved Internships and Residencies in the United States, J. A. M. A. **156**: 321 (Sept. 25) 1954.

who may be a perfectionist in the clinical procedure but who is lost under an uninformed doctor's authority when the unusual occurs.

The need for better patient care as voiced by the hospital administrators and the earnest desire for more knowledge by the general practitioner have been heard by organized medicine and the American Society of Anesthesiologists. The responsibility and obligation to offer training programs for part-time anesthesiologists in order to improve the anesthesia available to the public has been cheerfully accepted by the trained anesthesiologist. Several flexible programs have been made available to all desiring them in all parts of the country. The refresher courses with a variety of subjects and a number of instructors have been sponsored by many local hospitals and county, regional, and state organizations. One of the largest programs is that sponsored by the Committee on Medical Schools and Postgraduate Education of the American Society of Anesthesiologists. This refresher course program has been enthusiastically received by those attending, which is shown by its rapid and steady growth. It is but one of several programs offered as regional-sponsored courses, which cover from 3 to 14 days. Primarily these are intended to attract physicians practicing anesthesiology full time, those in residency training, and those interested in research. Because of these factors and the travel time necessary, this portion of the educational program does not appeal to the part-time physician anesthesiologist.

CURRENT ANESTHESIOLOGY PROGRAMS

Postgraduate courses in the various phases of anesthesiology, such as inhalation anesthesia, regional anesthesia, and replacement therapy, have been offered for several years. These are concentrated courses in which the individual sessions follow one another, day after day, in such a way that the physician attends the course from the beginning to the end as a full-time student. This type does not require the physician to leave his practice for a long period of time, and in many instances it is possible to attend during a vacation period. Usually the entrance fee is minimal. An objection that has been offered to this type of training is the limited number of instructors involved in each course. Vollan in his report describes this part-time specialist, one who does general practice with particular attention to a specialty, as probably the largest consumer of special postgraduate courses limited to a narrow field of medicine, and it appears to him that increased training stimulates a desire for further postgraduate work rather than reducing it.[2b]

In order to satisfy further the educational needs of the physician who wishes to do a better job for his patient, a more flexible program has been made available. During the early part of 1955, a committee under the direction of Dr. Oral B. Crawford requested each state society of anesthesiology to form a committee to assist in the development of this phase of postgraduate education for the part-time anesthesiologist.[4] As soon as this was accomplished and each committee was instructed in the responsibility for the organization and presentation of this program, questionnaires were sent to the secretary of each county medical society and to each hospital administrator. From these returned questionnaires, the names and addresses of approximately 5,000 part-time anesthesiologists have been obtained. Not one of these is of a nationally organized group. Each of these part-time anesthesiologists was sent a questionnaire to ascertain his interest in obtaining postgraduate training in anesthesia. If he is interested in such a program, a further attempt will be made to determine the techniques that he employs, the type of training that would interest him, the time he will have available, and the drugs and techniques in which he desires more knowledge and skill. From questionnaires sent to teaching institutions and chairmen of departments of anesthesiology, a list of locations of postgraduate courses available to general practitioners has been compiled. To this list of almost 100 available locations, a brief description of the course was added, including the type of training, duration of the course, time it is offered each year, fee, and for whom it is designed. This list has been made available not only to these 5,000 physicians but to all general practitioners who attended their annual meeting in Los Angeles, March, 1955, and it will also be published.

In the development of this phase of training many of the objections previously found are avoided. The number of institutions willing to participate is increasing and can be found in practically every area of the United States. Anesthesiologists are anxious to make the clinical and didactic material available to student physicians at times convenient for them to leave their patients and to assist them in meeting the postgraduate training qualifications set up by the American Academy of General Practice, which requires its members to show evidence of 50 hours of formal training every three years in order to retain membership in the organization. The College of General Practice of Canada has recently been organized, and it requires 50 hours of formal graduate work every two years. The trained anesthesiologist wishes to do his part for both of these organizations to keep their membership up-to-date at all times and with as small a financial outlay as possible. Many institutions are cooperating without any tuition unless it is necessary for administrative reasons.

In the formation of these individualized programs, the special needs of each physician will be determined by close supervision of this clinical work. He will learn by doing, which places the burden upon the student. During this association the fundamental techniques and concepts will be instilled in him to think as an anesthesiologist and to find his place as a consultant in this physician-patient relationship. Anesthesiology has been made deceptively easy and, therefore, potentially dangerous in the hands of the inexperienced. The general practitioner in regular hospital work can and must do better than perpetuate outmoded methods of the past.[5]

169 E. Flagler St. (32).

4. Crawford, O. B.: Personal communication to the author.

5. Gillies, J.: Advances in Anaesthesia, Practitioner **167**:418 (Oct.) 1951.

USE OF PHENACEMIDE IN EPILEPSY, WITH ANALYSIS OF FATAL REACTIONS AND CASE REPORT

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Phenacemide (Phenurone) is of proved value in psychomotor epilepsy. It is capable of relieving patients resistant to other antiepileptics, although its therapeutic effectiveness must be balanced against its toxic effects. Phenobarbital and diphenylhydantoin (Dilantin) are relatively safe drugs in the treatment of epilepsy; however, other anticonvulsant drugs, such as 3-methyl-5,5-phenylethylhydantoin (Mesantoin), trimethadione (Tridione), paramethadione (Paradione), and phenacemide, may produce moderately severe, but reversible, side-reactions and, in some patients, dangerous effects. Newer anticonvulsants such as primidone (Mysoline), metharbital (Gemonil) and N-methyl-α-phenylsuccinimide (Milontin) require further clinical study before their value in relation to other antiepileptics can be assessed. Milontin, for example, has been shown to cause transient renal damage. The problem of various hypersensitivity reactions as related to these drugs is now being brought into sharp focus because of such reactions.

Phenacemide is the only one of these drugs known to have caused fatal toxic hepatitis. Death from acute hepatitis due to Mesantoin had been reported in one patient, but subsequent investigation apparently absolved from blame the use of this drug as the cause of death. It is the purpose of this paper to analyze the eight reports of deaths associated with phenacemide therapy, to present one of these case reports, and to discuss briefly the pharmacology of, indications for, and precautions in the use of the agent, with the hope that the clinician may become more aware of untoward reactions from this agent and associated agents.

PHARMACOLOGY

Chemically phenacemide is phenacetylcarbamide or phenacetylurea. It is closely related in structure to diphenylhydantoin and to Mesantoin; if the hydantoin nucleus is opened between the carbon 5 and the adjacent nitrogen, a straight-chain compound, the corresponding acetylurea, is formed (fig. 1). Phenacemide contains the phenyl radical that seems to be one of the important substituents in the anticonvulsant activity of both the barbituric acid derivatives (phenobarbital and mephobarbital) and the hydantoin derivatives (diphenylhydantoin and Mesantoin). It is noteworthy that the phenyl radical is not present in the oxazolidine derivatives (trimethadione and paramethadione), drugs particularly effective in petit mal epilepsy.

Phenacemide was synthesized by Spielman and coworkers in 1948, examined for anticonvulsant activity by Everett and Swinyard, and first reported clinically by Gibbs and associates in 1949, who found it particularly effective in patients with psychomotor seizures. Subsequently, a large number of publications called attention not only to the unique value of phenacemide in psychomotor epilepsy but also to the considerable hazard involved in its use. An extensive review of data is that of Tyler and King, who analyzed the major side-effects. Phenacemide has a very low toxicity when given to experimental animals, and it effectively raises the threshold for, or completely suppresses, both electroshock and pentylenetetrazol (Metrazol) convulsions. Experimental evidence indicates that the liver plays a part in the destruction of phenacemide. Dogs given large doses for 18 months appeared to be healthy and had normal values for blood and urine analyses and kidney function tests. Liver function tests remained normal, or showed only slight impairment in some tests. Repeated bone marrow smears from the dogs showed normal marrow elements. It is claimed that in animals large areas of liver must be damaged or resected before any damaging effects from use of the drug are noted. In comparative tests phenacemide has been considered equal or superior to available anticonvulsants and has been found superior to all other drugs tested against psychomotor-type seizures produced in animals.

INDICATIONS AND PRECAUTIONS FOR USE

Because of the possibility of severe hypersensitivity reactions (to be outlined later) phenacemide should be administered only after other accepted anticonvulsants have been tried and found ineffective in controlling the seizures. Since phenobarbital and diphenylhydantoin are relatively safe and effective anticonvulsants, these drugs should be given an adequate trial in the majority of new cases. When it becomes necessary to use drugs such as Mesantoin, trimethadione, and phenacemide, the initial dose should be small. A carefully taken history of allergy, skin reactions, bleeding tendencies, and irregularities of the gastrointestinal tract and renal systems must be obtained. The intelligence, cooperation, geographical accessibility, and reliability of the patient should be determined. The patient should be informed of the risks and symptoms of side-effects and of the urgency of immediate reports to the physician when symptoms do occur. Before treatment is started, a urinalysis, blood cell count, platelet estimation, and hematocrit determination should be made. In addition, a urobilinogen test is necessary when phenacemide is to be used. These examinations should be repeated at two week intervals during the first year and once a month thereafter. Such precautions will prevent most fatal reactions. If the cost and inconvenience of these procedures make them impractical, the drugs should not be used. Sudden withdrawal of effective medication, especially diphenylhydantoin or phenobarbital, is dangerous because a plethora of seizures may follow. Use of these drugs do not cause mental

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deterioration if prescribed in suitable doses, but, with certain ones, a constant vigil must be maintained for evidence of toxicity. Occasionally, severe mental aberrations make it advisable to stop use of the drugs. Toxic reactions may occur very early or very late. Unremitting caution must be exercised in using anticonvulsants, and a record must be kept of persons receiving them. A note should be made of the date the patient is scheduled to

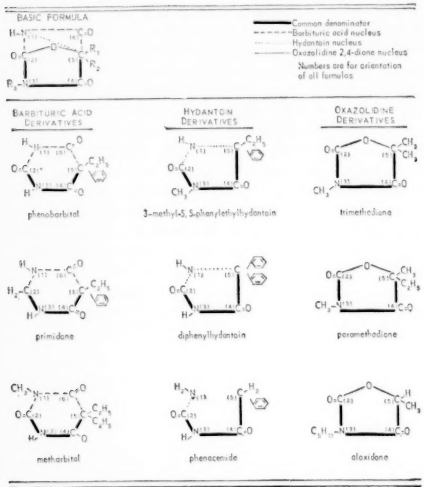

Fig. 1.—Chemical structure of commonly used anticonvulsant drugs (after Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics, ed. 2, New York, the Macmillan Company, 1955, pp. 180-182).

have follow-up laboratory examinations. If the appointment is not kept, a registered letter should be sent repeating the warnings already given the patient and urging prompt attention. Including the following case, there have been eight deaths recorded that have been attributed to the use of phenacemide. These cases will be analyzed later.

REPORT OF A CASE

A 35-year-old male veteran was admitted to the Veterans Administration Hospital, Fort Douglas, Utah, on Aug. 20, 1953, for treatment of epilepsy. He had been taking diphenylhydantoin and phenobarbital since 1946, when a diagnosis of grand mal epilepsy was first made. He exhibited mental deterioration, and his seizures had become resistant to the common forms of anticonvulsant medication, including trimethadione. His physical condition had always been good. There was no history of jaundice, cirrhosis of the liver, or disease of the hematopoietic system, nor was there any history of dermatitis or illness compatible with a drug hypersensitivity reaction.

Although he always enjoyed excellent physical health and had no interim infections, he continued to have grand mal and psychomotor seizures. He was increasingly aware of memory loss, and at the time of his admission to our hospital his behavior was described as psychotic. He had been taking 0.1 gm. of diphenylhydantoin and 0.032 gm. of phenobarbital three times daily. No other medication had been given for a period of six months prior to hospitalization, and he only received anticonvulsant drugs during his hospitalization. Trimethadione had been given several times in the past without evidence of toxicity; its use was begun again Sept. 18, 1953, 0.3 gm. twice daily. Phenacemide was first given on Dec. 5, 1953, 0.5 gm. twice daily. His convulsive episodes became fewer, but his behavior remained schizoid. Under guardianship, he was granted a leave of absence from Dec. 22, 1953, to Jan. 4, 1954. There were no changes in liver function tests, including urine urobilinogen, and blood cell counts and urinalyses stayed normal.

He returned from leave in good condition. No changes in his behavior were noted until Jan. 12, 1954, when he appeared ataxic and more confused after a grand mal seizure. He became noticeably jaundiced on Jan. 16, 1954, and therapy with all anticonvulsant drugs was discontinued. He had received therapy with these drugs in the following quantities: diphenylhydantoin, 0.3 gm. daily for nearly eight years; phenacemide, 42 gm. (total dosage) over a period of 42 days; and trimethadione, 72 gm. (total dosage) over a period of 109 days. He became rapidly comatose, the icteric index rose to 100 units, and the serum bilirubin level rose to 25 mg. per 100 cc. on Jan. 18, 1954. Blood glucose, blood urea nitrogen, and carbon dioxide combining power of the blood were normal on that date, as were the serum cholinesterase, serum cholesterol, and serum alkaline phosphatase determinations. Prothrombin activity was recorded as less than 10% of normal. The cephalin flocculation test was 3+; the thymol turbidity test was normal. A qualitative urine urobilinogen test was strongly positive. Plasma electrolytes, including sodium, potassium, and chlorides, were normal. Bleeding time, coagulation time, clot retraction, and number of platelets were normal. Urinalysis was negative. The hematocrit determination was normal. Leukocyte count was 12,000 per cubic millimeter, with no other abnormal findings on the smear. A spinal fluid examination was negative; fluid dynamics were normal. The chest roentgenogram (portable) revealed no abnormal findings. The electrocardiogram showed no unusual features except sinus tachycardia. The patient did not respond to therapy. By Jan. 19, 1954, he was in deep hepatic coma and fetor hepaticus was easily detected. Despite vigorous supportive measures, he died on Jan. 20, 1954, without further convulsive seizures and without showing hemorrhagic tendencies.

Autopsy Findings.—Postmortem examination revealed generalized discoloration of tissues due to hyperbilirubinemia and changes in the liver characteristic of acute yellow atrophy. The liver was greatly diminished in size, weighing only 800 gm. The capsule was smooth and glistening, and in some areas the lobular

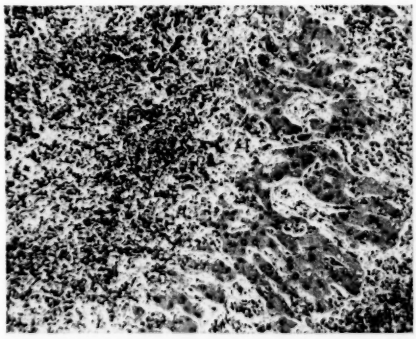

Fig. 2.—Photomicrograph showing profound disintegration and necrosis of liver cells in acute yellow atrophy (× 100).

pattern of the liver could be identified through the capsule. The parenchyma was moderately flabby and, when laid on the table, caused the liver to assume a pancake-like shape. On sectioning, the parenchyma bulged beyond the capsule, and it was mottled with red pinpoint areas and streaks of yellow. The hepatic lobules were scarcely visible. Microscopically, the picture was one of profound disintegration and necrosis, the structure of the hepatic cells being completely lost and replaced by granular debris (fig. 2). Only a thin rim of intact hepatic cord cells surrounded the periportal triads. The biliary radicles and vessels did not appear

abnormal. There were no changes of note involving the kidney, heart and vessels, pancreas, brain and spinal cord, gastrointestinal tract, lungs, lymph nodes, bone marrow, adrenal glands, spleen, or other organs.

DEATHS ASSOCIATED WITH PHENACEMIDE THERAPY

Levy and others [1] have suggested the following criteria to establish the basic role of drug toxicity in any given case: 1. The patient must have been in good health prior to the administration of the agent. 2. The causative agent must have been given over a sufficient period, uncomplicated by other medicaments. 3. The illness in question must be unrelated to any other obvious etiological process. 4. The drug must be shown to have caused similar toxic effects in animals or in human subjects. 5. Pathological findings must confirm the involvement of the systems affected in the clinical picture. All these criteria are fulfilled in the eight fatalities attributed to phenacemide therapy (see table), with minor exceptions that will be discussed. It is difficult to exclude the possibility of viral hepatitis, but in each case the relation of the phenacemide treatment and the hepatitis can be regarded as more than coincidental. Analysis of these deaths in association with a new drug is of the utmost importance; the dangerous toxic effects of trimethadione, paramethadione, Mesantoin, and phenacemide have been reviewed elsewhere. Drug-induced hypoplastic anemias are common to all of them, but Mesantoin offers the highest risk in this connection. Several cases of the nephrotic syndrome resulting from trimethadione have been reported. At least 40 fatalities from the use of these drugs have now been reported during the past seven years. Osgood [2] concludes that phenacemide is an agent known to produce hypoplastic syndromes of the drug hypersensitivity reaction type. The mechanism of action is still uncertain. The two cases of aplastic anemia attributed to phenacemide have been described in detail by Forster and Frankel [3] and by Simpson and others.[4] In these cases it appears that phenacemide was the anticonvulsant causing the deaths. Mesantoin therapy had been used in both patients but had been discontinued 60 and 175 days, respectively, prior to onset of toxic reactions in these two cases (see table, cases 1 and 2).

It is significant that of the more widely used anticonvulsant drugs, phenacemide is the only one proved to have caused severe toxic effects on the normal liver. Therefore, the clinician must constantly look for evidence of impending liver damage while his patient is undergoing therapy with the drug. Before any deaths were reported from toxic hepatitis, Lloyd-Smith [5] described a case of acute hepatitis, with jaundice developing after 70 gm. of phenacemide had been given for two months. The serum bilirubin level was 4.4 mg. per 100 cc.; the alkaline phosphatase level was 13 units per 100 cc. (Bodansky); the cephalin flocculation was 4+; and the thymol turbidity was reported as 7 units. One week after cessation of therapy with the drug, the jaundice disappeared and liver function tests had returned to normal. Livingston and Kajdi [6] alluded to the occurrence of nonfatal hepatitis in one out of 104 patients receiving the drug, and Carter and others [7] described two cases of acute hepatitis with recovery among 63 patients taking phenacemide. These cases proved to be an indication of the ability of this agent to produce more serious toxic effects on the liver, and within a few months the first three cases of fatalities due to phenacemide-induced hepatitis were reported. In one of these patients there were also changes representing the resolving phase of lower nephron nephrosis [1] (see table, case 3). The icteric index had risen to 42 units; albuminuria was present, and the blood urea nitrogen level was 227 mg. per 100 cc. The prothrombin

Analysis of Deaths Attributed to Phenacemide Therapy

Case No.	Observer	Year Reported	Therapy: Phenacemide Days	Therapy: Phenacemide Total Dose, Gm.	Other Anticonvulsants	Pathological Findings
1	Forster and Frankel [3]	1949	60	90	Diphenylhydantoin, 14 mo.; Mesantoin, 6 mo. (therapy discontinued 60 days before death)	Aplastic anemia
2	Simpson and others [4]	1950	180	425	Diphenylhydantoin, 2 yr.; Mesantoin therapy discontinued 175 days before symptoms	Aplastic anemia
3	Levy and others [1]	1950	80	120	Diphenylhydantoin, 9 yr.	Hepatorenal syndrome
4	Levy and others [1]	1950	44	51	Mesantoin and trimethadione, 9 mo.; diphenylhydantoin for years	Acute yellow atrophy of liver, with significant renal findings
5	Davidson and Lennox [8]	1950	45	50	Diphenylhydantoin, many years	Acute, severe parenchymal liver damage, superimposed on older portal cirrhosis, mild
6	Liversedge and others [9]	1952	25 †	72	Trimethadione therapy discontinued 12 mo. prior because of rash and leukopenia	Acute yellow atrophy of liver
7	Field and Justi [10]	1954	210	609	Diphenylhydantoin, 21 mo. (total dose, 252 gm.)	Massive necrosis of liver parenchyma
8	Craddock *	1955	42	42	Trimethadione, 110 days (total dose 72 gm.); diphenylhydantoin, 7 yr.	Acute yellow atrophy of liver

* This report.
† Rash appeared after 28 days, and therapy was restarted two weeks later for 2 days.

1. Levy, R. W.; Simons, D. J., and Aronson, S. M.: Fatal Hepatorenal Syndrome Associated with Phenurone Therapy, New England J. Med. **242**: 933-936 (June 15) 1950.
2. Osgood, E. E.: Drug Induced Hypoplastic Anemias and Related Syndromes, Ann. Int. Med. **39**: 1173-1188 (Dec.) 1953.
3. Forster, F. M., and Frankel, K.: Fatal Aplastic Anemia During Anti-Convulsant Therapy: Report of a Case During Phenurone Therapy and Following Mesantoin Therapy, Dis. Nerv. System **10**: 108-111 (April) 1949.
4. Simpson, T. W.; Wilson, E. B., Jr., and Zimmerman, S. L.: Fatal Aplastic Anemia Occurring During Anticonvulsant Therapy: Probable Idiosyncrasy to Phenurone, Ann. Int. Med. **32**: 1224-1228 (June) 1950.
5. Lloyd-Smith, D. L.: Phenurone and Hepatitis, Canad. M. A. J. **62**: 493-495 (May) 1950.
6. Livingston, S., and Kajdi, L.: The Use of Phenurone in the Treatment of Epilepsy, J. Pediat. **36**: 159-164 (Feb.) 1950.
7. Carter, S.; Sciarra, D., and Merritt, H. H.: Phenylacetylurea in Treatment of Convulsive Seizures, Dis. Nerv. System **11**: 139-141 (May) 1950.

activity was 40% of normal, and the cephalin flocculation was 3+. The patient remained comatose for one week and became anuric. The autopsy revealed a liver of normal size and grossly normal appearance; however, microscopic examination revealed injured hepatic cells displaying various degrees of change, consisting essentially of a granular cytoplasm with numerous, indistinct vacuoles. The parenchyma of the kidneys appeared somewhat swollen and edematous. Microscopically, the glomeruli appeared normal, but many of the distal convoluted tubules were dilated and some were filled with pink-staining casts.

Levy and others [1] reviewed the clinical course and autopsy findings in another patient (see table, case 4) who died of acute yellow atrophy of the liver. This patient was receiving Mesantoin, trimethadione, and diphenylhydantoin. He died in coma 51 days after phenacemide was included in his therapy; he had been given therapy with Mesantoin and trimethadione for nine months and had received diphenylhydantoin for many years. The liver appeared shrunken and was soft and friable. Microscopic examination of the liver revealed extensive destruction of the basic lobular architecture and severe necrosis of most of the hepatic cord cells. In addition, gross inspection of the kidneys showed them to be swollen, but the capsule stripped with ease. Microscopic examination revealed ischemic glomeruli, with thickening of the capillary walls, and there was marked degeneration of both straight and convoluted tubules.

Davidson and Lennox [8] described a case of severe acute parenchymal damage of the liver (see table, case 5). Therapy with diphenylhydantoin had failed to give any relief from the seizures; no other medication was given. Phenacemide was administered for only 45 days (total dose 50 gm.), but after three weeks with phenacemide therapy the patient complained of lethargy, diarrhea, and anorexia. Symptoms were first attributed to an epidemic gastrointestinal disturbance then prevalent in the community. Jaundice was noted three weeks later; the patient died shortly thereafter from hepatic coma. Autopsy revealed acute, severe parenchymal damage to the liver, superimposed on an older portal cirrhosis of mild to moderate degree. A case of acute yellow atrophy of the liver following phenacemide therapy was next reported by Liversedge and others.[9] It is very significant to note that the patient developed a severe skin rash when trimethadione was given a year previously; there had been no other sign of toxic effect from trimethadione, but therapy with the drug was discontinued. Therapy with phenacemide was likewise discontinued when a rash developed after 23 days of treatment; it was restarted two weeks later on the insistence of the mother of the patient, since seizures had again become severe. Two days after the readministration of phenacemide therapy, the child became very listless and his eyes were noticeably puffy. Therapy with the drug was again stopped, but jaundice and hepatic coma ensued and the patient died. The most striking laboratory finding was the extremely low level of prothrombin activity; the authors urge that prothrombin activity be followed when patients are treated with phenacemide therapy. Autopsy in this case revealed liver lesions characteristic of acute yellow atrophy; the kidneys were normal. Field and Justi [10] have reported another case of fatal hepatitis after phenacemide therapy for epilepsy (see table, case 7). The interval between the initiation of phenacemide treatment and death in this case was seven months—much longer than that of the other cases (25 to 86 days). Postmortem findings included evidence of massive destruction of the liver parenchyma, and the only viable tissue was a collection of hepatic cell cords.

I have had the opportunity to study the case of a 42-year-old woman admitted to the Letterman Army Hospital, San Francisco, on April 20, 1954.[11] She had received phenacemide therapy for approximately 200 days; the total dose of the drug was about 100 gm. She was critically ill and had recurring chills, jaundice, and a temperature of 104 F (40 C). She was also mentally confused. The liver was moderately enlarged, and there was marked ascites. Pertinent laboratory findings were as follows: serum bilirubin level was 4.2 mg. per 100 cc.; sulfobromophthalein retention was 30% in 15 minutes; blood urea nitrogen level was 18 mg. per 100 cc.; and serum protein levels were normal. Repeated paracenteses were performed weekly, and as much as 8,000 cc. of straw-colored fluid with the characteristics of a transudate were removed on one occasion. Biopsy of the liver revealed "focal necrosis and fibrosis with slight periportal inflammation." Because of impending hepatic coma, 400 mg. of cortisone was given daily, and a profuse diuresis occurred after two weeks of hormonal therapy; the ascites disappeared completely. Therapy with cortisone was discontinued after three weeks, during which a total of 8.5 gm. had been given. A second biopsy of the liver on June 11, 1954, revealed "focal postnecrotic scarring, with a definite increase in fibrous tissue, as compared to the previous liver biopsy; there is evidence of regeneration of bile ducts and liver cells." The patient has been maintained on therapy with diphenylhydantoin and phenobarbital since discharge from the hospital on June 16, 1954, and she remains well. This case, as well as other cases recently reported in the literature, illustrates the value of cortisone therapy in patients with impending hepatic coma.

COMMENT

Since hepatic coma appeared to be the terminal feature in six of the deaths attributed to phenacemide therapy, it is appropriate to review certain clinical features of this event. This type of coma is first characterized by lethargy or abnormal excitement progressing to unconsciousness, often attended by convulsions, in the immediate period before death. The appearance of the disordered mental state, the convulsive episodes, and the coma coincide with what appears to be serious metabolic decompensation. Fever, fetor hepaticus, Kussmaul-type respiration, dryness of mucous membranes, muscular twitchings, oliguria, and anuria are some of the findings suggestive of gross physiological breakdown; however, review of the findings obtained from routine blood and

8. Davidson, D. T., Jr., and Lennox, W. G.: Phenacetylurea—Phenurone—in Epilepsy, Dis. Nerv. System **11**: 167-173 (June) 1950.

9. Liversedge, L. A.; Yates, P. O., and Lempert, H.: Acute Yellow Atrophy of the Liver Following Treatment with Phenylacetyl-Urea, Lancet **1**: 242-43 (Feb. 2) 1952.

10. Field, J. B., and Justi, R. A.: Fatal Hepatitis After Phenurone Therapy for Epilepsy, New England J. Med. **251**: 147-149 (July 22) 1954.

11. Berry, W. C.: Personal communication to the author.

hepatic tests serves to emphasize their lack of sensitivity for predicting or measuring hepatic damage.

The basic pathology of this condition is varied, as has been shown by the different microscopic findings in the 11 cases reviewed by Carfagno and others.[12] The maintenance of a normal concentration of blood sugar and blood urea nitrogen in most of these cases does not detract from the significance of reduced levels in the individual patient with advanced parenchymal failure. The point can be made, however, that the metabolic derangements in hepatic coma do not necessarily depend on or coincide with depression of these levels. The appearance of jaundice marks the stage of serious parenchymal failure. The positive cephalin flocculation test in most cases contrasts with the normal thymol turbidity and the alkaline phosphatase tests. The blood electrolyte studies reveal little indication of the severity of hepatic parenchymal failure. Other abnormalities that may appear include elevated or increased blood levels of ammonia, ketones, and pyruvate; decreased levels of cholesterol and cholesterol esters; and failure of various enzyme systems. The electroencephalogram may show definite slowing of the brain waves and a decrease in their amplitude. Neutral fat and fatty acid levels are not consistently changed.

SUMMARY AND CONCLUSIONS

It is significant that, of the commonly used anticonvulsant drugs, phenacemide (Phenurone) is the only one proved to cause severe toxic effects on the normal human liver. One of the most striking findings in the cases discussed in this paper appears to be the very low level of plasma prothrombin activity, often associated with relatively normal values for other tests of liver function. Hepatic coma appeared as the terminal mechanism in six of these cases. All the newer anticonvulsant drugs have produced dangerous, often fatal, reactions. Evidence has been presented that periodic blood cell counts and liver function studies may be of little aid in reducing the morbidity or mortality caused by therapy with these drugs. It is considered that the therapy of first choice in grand mal epilepsy is diphenylhydantoin (Dilantin) alone, or with phenobarbital, for a reasonable period of time (three to six months). Therapy with the other drugs should be given only after careful consideration, with the knowledge that occasional fatalities may be anticipated. The question as to whether the toxicity of a drug outweighs its therapeutic advantages must be answered before employing it. A drug obviously should be used with caution in any individual with a history of previous liver or renal disease. It is best to limit the use of phenacemide therapy to patients with psychomotor epilepsy. Better and safer agents for treatment of grand mal epilepsy are available. In psychomotor epilepsy, either diphenylhydantoin or primidone (Mysoline) are drugs of first choice; phenobarbital is of little or no value. If the psychomotor seizures are uncontrolled, it is best to try 3-methyl-5,5-phenylethylhydantoin (Mesantoin) before a final resort to phenacemide therapy.

12. Carfagno, S. C.; DeHoratius, R. F.; Thompson, C. M., and Schwartz, H. P.: Hepatic Coma: Clinical Laboratory and Pathological Study, New England J. Med. **249**: 303-309 (Aug. 20) 1953.

THE PHYSICIAN AND THE CHAMBER OF COMMERCE

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American physicians, theoretically in the forefront as proponents of the free enterprise system, are actually denying their support to that system. Too many of them are withholding physical and financial support from their local chambers of commerce, potentially the strongest single force in existence to perpetuate and refine our free enterprise system and to improve the general welfare of our communities. Strong words? Yes, but true. Although some few communities in this country have as high as 90% of their physicians belonging to the local chamber of commerce, others have as low as 10%, and the general average for the entire nation is undoubtedly considerably below 50%.

The situation is a great professional paradox. The physicians have by far the highest average educational level in any community—they have had at least eight years of education beyond high school and some even more. They are above the average in intelligence, or they would not have survived the high selectivity of the physician's training program. They are well above the average income level, if only for the statistical reason that people with higher educations have 77% of the country's $5,000 a year incomes and 82% of the incomes that exceed $10,000. And finally, they are accorded a prestige unique in American life, a prestige that is inescapable, immeasurable, and occasionally incomprehensible. These educational and financial and general social advantages set physicians apart as a great potential influence in chamber of commerce work. It is an influence that is sorely needed and wanted. If this privileged class does not assume the responsibilities of American ideology and of community welfare, who in the community should?

RESPONSIBILITY AS CITIZENS

The very prestige of the physician has undoubtedly in the past acted as a deterrent to his participation in chamber of commerce work. He has often practiced his divine healing art on a pink cloud, far off by himself, uninterrupted and unaffected by the microcosmic and the mundane. In recent years he, along with other professional people, has fallen out of his cloud with a perceptible thud. He has had very practical experience with the world around him in such matters as socialized medicine, doctor's draft, veterans' medical problems, malpractice suits, and fee and salary problems. He has seen all types of medical legislation proposed on a national level, vital medical issues weighed on a state level, and health problems thoroughly explored on a local level.

Perhaps because of this probing and intrusiveness, Mr. Average Man no longer idly watches his physician

President, Greater Hazleton Chamber of Commerce.

floating on his pink cloud. He expects him to be a citizen as well as a healer. Contrariwise, the physician has perhaps been rudely awakened to the fact that this is so. As Theodore Roosevelt observed, "Every man is, first, a citizen of some community." Our citizenship antedated our professional work and will probably postdate it. As citizens we are, *ipso facto,* deeply interested in our communities, and that is where the chamber of commerce comes in.

OBJECTIVES

A chamber of commerce is an organization that coordinates and integrates the talents and resources of businessmen and professional men trying to make their community a better place in which to live and earn a living. Its programs are dedicated to the improvement of living standards and improvement of the economic condition of all residents, not a favored few. Its entire function is the initiation and support of projects in the public interest. In a real sense, the chamber epitomizes the free enterprise system and the American idea of progress and growth. Its genius lies in organizing and directing the energies of those men in every community who believe that their city has a place in the sun and are determined to find that place. Lord Byron said, "I live not in myself, but become a portion of that around me." The reasons why every American physician should be a portion of his surroundings, and particularly his chamber of commerce, appear self-evident; and yet more than 50% of us are not.

My own interest in our local chamber of commerce began slowly, prodded primarily by the fact that we live in an economically distressed area and that the local chamber, by its own efforts, and by its efforts alone, was bringing new industry into our area. That seemed rather vital to my own livelihood and that of the other professional people in our community. Just how vital? The Chamber of Commerce of the United States, in a most scientific and meticulously accurate survey of nine sample counties throughout the nation, discovered some startling figures concerning the effect of new industrial jobs on a community. They found that just 100 new factory workers meant the following things to their community: 296 more people, 112 more households, 51 more school children, $590,000 more personal income per year, $270,000 more bank deposits, 107 more passenger cars registered, 174 more workers employed, 4 more retail establishments, and $360,000 more retail sales per year.

Stimulated by this knowledge, exactly 100% of our 57 physicians joined the chamber of commerce and so did 75% of our lawyers and 70% of our dentists. After most of us were in, we wondered why physicians everywhere were not. One of us discussed this question on the programs of the 1954 and 1955 annual meetings of the Chamber of Commerce of the United States. At these meetings chamber of commerce executives from throughout the country told us of their particular problems with the physicians in their own areas.

OBJECTIONS AND ANSWERS

The following section is a compilation, as accurately as could be digested, of the objections that physicians in different sections of the country had to membership in their chamber of commerce and just how those of us who are already members would answer these objections:

1. Objection: Costs too much.

Answer: We have also heard a great deal of griping about medical society dues. Such an objection in either case appears passing strange, in view of the fact that each member of the United Automobile Workers pays his union $90 a year in dues and assessments, and other union members pay similar amounts. Comparably, chamber of commerce dues appear inordinately low. The objection itself is not peculiar to the medical profession. It is heard everywhere. The dues vary widely in different localities but usually range between $20 and $50 a year for an individual. That is mighty cheap insurance for the future of your community and, incidentally, yourself. Despite some confusion on the issue, chamber of commerce dues have several times been ruled income-tax deductible by the Internal Revenue Department on the basis that the money is being used for the furtherance of the physician's business. That ruling itself speaks volumes.

2. Objection: It is not professional or ethical.

Answer: Get off that pink cloud. Is it professional to be an isolated clique in the community? Is it ethical to forget that one is a citizen as well as a physician? Chamber membership is not only professional, not only ethical, but distinctly recommended by the American Medical Association through its Public Relations Department.

3. Objection: Too busy.

Answer: All successful men are too busy, but does that mean they should deny their talents to their community? To stoop to a cliché, if you want something done, ask a busy man. If you don't honestly have the time to participate actively, do not withhold your moral and financial support. Your chamber of commerce will handle your share of community betterment and civic duty while you are not available.

4. Objection: The chamber accepts members who are members of the "fringe professions" or even out-and-out quacks.

Answer: Perhaps it does. The chamber will accept anyone who is interested in the betterment of his community. Would it not be considered a sad commentary if the so-called undesirables were interested and the physicians not? And is it better for the fringe professions to speak for the professional group on community problems or the physicians themselves?

5. Objection: Physicians make their contributions to their communities through clinics and charity services and should not be called upon to give more.

Answer: Free work for those unable to pay is our proud heritage and responsibility. Let us not cheapen our heritage by bargaining with it nor shirk our responsibility by underestimating it. As a group we do well enough to support civic affairs actively as well as passively.

6. Objection: Not a democratic organization—run by big business.

Answer: Not so. Chambers of commerce are run in a truly democratic manner. All of the members of a local chamber vote for and elect their board of directors, and the board in turn elects the officers. Local chambers, providing they are members of the national body, also vote for representatives who sit on the board of the Chamber of Commerce of the United States. Anyone really interested is warmly welcomed in chamber of commerce work.

7. Objection: Not a truly local organization—run by an all-powerful United States Chamber of Commerce.

Answer: Again not so. The local chamber is probably the most completely autonomous organization in the community. It carries out its own program in its own way and is answerable only to its own members and the community itself. True, it often calls upon the limitless storehouse of knowledge and experience in the state and national organizations and is sent valuable information by these organizations; but, in the final analysis, all decisions on local, state, or national issues rest with it alone.

8. Objection: Do not like the way it is run locally or the people who run it.

Answer: This answer is obvious. Suppose you do not like your city administration or your elected city officials? You get nowhere by picking up your marbles and going home. Just become a member and give the organization the benefit of your ideas. Critical or otherwise, your voice will always be welcomed.

9. Objection: Do not believe in its policies.

Answer: That is somewhat like saying you do not believe in motherhood or kindness to dumb animals. Simmered down, its policies are basically those of community betterment, the free enterprise system, and the Constitution of the United States.

10. Objection: Do not believe in belonging to other than professional organizations.

Answer: All right, be an ostrich; but remember what has happened in veterans' organizations because of similar unconcern and how we have already succumbed to some of the powerful political lobbies of fringe professions. And much more basically, of course, we must again stress the point of civic responsibility.

11. Objection: Just a bunch of impractical do-gooders, like a Greek letter fraternity.

Answer: That question must be answered locally. It usually means that the work that the chamber has done and is doing is not sufficiently publicized. There is probably not a community in the country that has not been bettered in many ways by its chamber of commerce.

12. Objection: I never got any business, directly or indirectly, from the chamber of commerce.

Answer: This is not a "scratch-my-back-I-scratch-yours" organization. If you buy or sell goods or services in your city, the chamber of commerce is working in your behalf. You obviously make a living, or you would not be here. You must enjoy living in the community, or you would not stay here. No man ever succeeded in any business or profession in the middle of the Sahara Desert. The chamber of commerce is the irrigation system that makes your garden grow.

13. Objection: We can get along without the local chamber and its overhead.

Answer: We can actually get along without any one of the hundred and one typically American organizations where men of good heart voluntarily band together for the common good—but who would want to? This organization is the only one of its kind that is oriented and implemented for community progress. No citizen would admit that his city has reached the saturation point of progress. You probably have not even scratched the surface of possibilities for future growth and prosperity. Business and professional men need an organization for organizing, planning, and thinking. They need a spokesman for their plans. Your chamber of commerce offers just that. And certainly there is an overhead. Nothing can run on the clean air of the city or the good wishes of its inhabitants.

14. Objection: Do not want to be identified publicly with any particular social or ideological group.

Answer: As a group we have been accused at various times of being antiliberal, antilabor, anti-man-on-the-street, and even anti-local business. That is the cross that must be borne in the crusade for progress. Actually the chamber is not anti anything except apathy and indifference and any attempted negation of the American way. If that be ideological identification, then let us make the most of it!

15. Objection: It actually keeps new industry out of our area.

Answer: In economically distressed areas the chamber of commerce is frequently made the whipping boy for all local ills. It is somewhat like blaming Sir Alexander Fleming for a case of pneumonia because his penicillin has not cured it. Obviously, since the chamber is composed almost entirely of businessmen and professional men, its very lifeblood depends on the addition and expansion of new industry in the area.

16. Objection: It attracts too much new industry to our area; we are already overcrowded, strangers are moving in, there are housing problems, labor problems, and parking problems.

Answer: Is there any limit to progress, any ceiling to success? If there are problems connected with progress, solve the problems; do not stop the progress.

17. Objection: The board of directors does not represent the professional viewpoint and commits the organization and sometimes the city to policies at variance with professional ethics.

Answer: I wish all the answers were this easy. If there is enough professional participation, there certainly never will be any question of variance from professional ethics.

18. Objection: I am too young to afford it (or too old to benefit from it).

Answer: Two variations of the same theme. If you are young and do not have a large income, you nevertheless probably have life insurance. Standing right next to life insurance in importance is community insurance. If the community does not prosper, neither will you. If you are old and cannot see much in the way of personal benefit, think of the older men who preceded you and made the community a better place for you to live.

19. Objection: It is an organization for big business, not the small businessman and individual.

Answer: Quite the contrary. It is just that small person who benefits most from the chamber of commerce. A big business usually has a paid staff to protect its interest, whereas a small business cannot afford similar services except through such an organization. The majority of members in any chamber of commerce are small businessmen or individuals cooperating to accomplish what they cannot accomplish alone. And who profits most from increased local prosperity and civic development—the large industrial plant owner who probably sells 99% of his product elsewhere, or you?

20. Objection: I just do not believe in things like this.

Answer: None.

CONCLUSIONS

There are the objections and the answers. In conclusion, there are three classes of residents in any community: those who live off it, those who live in it, and those who live for it. The first class are parasites, reaping where they do not sow. They are not applicable to this summary, and they beggar description. The second class lives in the community but has little or nothing to do with its activities. If enough of the population are in this group, there is community hari-kari. The third class of residents of a community—those who live for it—recognize their political, social, and economic duties as citizens by taking an attitude of live civic brotherhood. Such men meet on common ground, regardless of professional status, social status, physical possessions, religion, or politics. Let it not be said of the physicians in any community that they abhor this common ground.

225 Markle Bank Bldg.

INTERIM REPORT, PUBLIC HEALTH SERVICE TECHNICAL COMMITTEE ON POLIOMYELITIS VACCINE

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Richard E. Shope, M.D., Joseph E. Smadel, M.D.
and
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COMMITTEE OBJECTIVES

On May 23, 1955, the surgeon general of the Public Health Service appointed a Technical Committee on Poliomyelitis Vaccine to review production and testing data on lots of vaccine submitted by manufacturers and to make recommendations concerning the release of such vaccine. As a result of an earlier review,[1] it was evident that it would also be necessary for this committee to study the details of manufacturing and testing procedures and to recommend requirements for production that would assure uniformly safe and potent vaccine.

RELEASE OF VACCINE

The significance of a negative test for infective virus on a given lot of vaccine is greatly enhanced if the particular lot is one of a series in which tests for infective virus are negative. This principle was confirmed by observations in the poliomyelitis vaccine field trial. Accordingly, recommendations for release of vaccine by the committee have been influenced as much by the plant record for consistency of performance as by the negative results of tests on the individual lots considered. Consistency of performance, together with a negative test on a particular lot, provides the greatest measure of safety. Observations on field performance of the vaccine in the United States, Canada, and Denmark during 1955 have fully supported this concept.

1. Technical Report on Salk Poliomyelitis Vaccine, U. S. Public Health Service, June, 1955.

INVESTIGATION OF VACCINE MANUFACTURING AND TESTING METHODS

The committee has been in operation for more than five months. During this time it has met repeatedly with manufacturers' technical representatives. With their cooperation the committee has investigated the important aspects of vaccine processing and testing. This report contains a summary account of the information obtained and the decisions reached. Although it is not possible to present here the voluminous data that have become available or to evaluate such information in detail, this summary may be useful in informing the medical profession and the public of the present state of the problems with which the committee has been concerned. Fuller technical accounts dealing with the separate subjects to which reference is made will be submitted for publication in *Public Health Reports* or other scientific journals.

EXPLANATION OF THE PROBLEM OF CONSISTENCY IN MANUFACTURE

The committee sought information bearing on the question of lack of consistency in production of vaccine by some manufacturers. Since the observed inconsistencies were not of the same order of magnitude in the case of all manufacturers—in fact, it could be said that the operation of the inactivation process was highly consistent in some laboratories—it was clear that the establishment of an equally consistent record of negative

tests by all manufacturers would necessitate an analysis of differences in manufacturing details.

In the case of those manufacturers whose process lacked the desired degree of consistency, it appeared that, in the early phase of inactivation, virus was being destroyed as rapidly and as uniformly as was expected. In some instances, however, there were traces of infectious virus that resisted treatment that theoretically was capable of inactivating much greater amounts of virus. This conclusion was evident from the results of the testing practices that were in effect before as well as after May 26, when the requirement for volume of sampling was changed. Moreover, such traces of active virus, in many instances, were not eliminated by the application of still further treatment. This was true for all three types of virus.

In considering reasons for failure of complete inactivation, it seemed that such failure could be due either to protection of virus from direct contact with formaldehyde or to the existence of virus particles that are inherently more resistant to formaldehyde. There is no evidence for the latter possibility. Rather, the facts support the concept that a physical barrier interfered with the contact required for chemical interaction between formaldehyde and the virus. The fact that failure of complete inactivation was not an industry-wide problem could also be interpreted to mean that details of manufacturing were at fault rather than the ineffectiveness of formaldehyde as a means for destroying virus infectivity in suitably performed routine vaccine manufacture.

In searching for the significant technical factors that might be operative, plant processes were reviewed and an examination was made of representative samples of virus-containing fluids prepared for the inactivation step by the different manufacturers. Although differences in details of processing were recognized in the review of plant procedures and certain conclusions could be reached therefrom, the significance of these differences became more apparent when studies were made of virus fluids prepared for inactivation by each of the manufacturers. The striking differences observed were in the degree of clarity of the different fluids and in the character of the sediments that were present in some. It was noted, also, that fluids that contained sediments failed to inactivate under conditions applied simultaneously and effectively to other fluids not having such sediments. This observation pointed strongly to a solid phase as the source of the physical barrier against complete interaction between virus and formaldehyde. Virus incorporated within a solid phase should not be expected to be inactivated in the same way as virus free in the fluid phase; in fact, it was for this reason that filtration was required from the beginning as a step in the procedure for vaccine manufacture. Unfortunately, the importance of uniform standards of filtration in large-scale production could not be fully appreciated until the difficulties resulting from departures from former production methods became known to the controlling agency.

In searching further, it was found that fluids that failed to be inactivated often had not been filtered just before addition of formaldehyde but had been filtered a number of months earlier. This made it difficult to decide, in some instances, whether the solid phase was formed on standing, whether it was due to material that passed through a defective filtration process, or whether it was due to both factors. It was evident, nevertheless, that such practices as would permit the existence of a solid phase could account for the occurrence of inconsistency of inactivation. It was not possible in most cases to evaluate the relative importance of inadequacy of filtration as compared with storage after filtration.

The idea that inadequacy of filtration, even without the influence of storage, might be responsible for the existence of "protected virus" was suggested by several observations. First, inconsistencies encountered seemed to be associated with the use of fritted glass filters. However, it was also evident, from a considerable body of experience, that fritted glass filters could be used satisfactorily. Second, the kind of inconsistency observed was not encountered by laboratories when Seitz-type filters were used, nor was it encountered in the preparation of vaccine for the field trial when Seitz-type filters for the most part were used.

CURRENT FILTRATION AND INACTIVATION REQUIREMENTS

Physical homogeneity as a necessary prerequisite for satisfactory inactivation can be approximated by requiring the application of proper filtration procedures in fixed time relationships to the inactivation process. This is being done by requiring that (1) the preinactivation filtration be carried out not longer than 72 hours prior to initiating the formaldehyde treatment, and (2) a second filtration be carried out during the inactivation process, at the time when infectivity is reduced to a point at or below the minimally detectable level, and several days prior to the taking of the first 500 ml. safety-test sample. By these practices, the degree of physical homogeneity required for a consistently reproducible process is maintained. Precipitates or aggregates above a certain size are eliminated both before formaldehyde treatment is begun and again during the process and prior to termination of the inactivation procedure.

The type of filter to be employed, the number required, and the maximal volumes to be passed in order to provide the kind of assurance desired have been specified in the current requirements. The purpose of these steps is to provide assurance of effective contact between the virus particles in suspension and formaldehyde throughout the inactivation process. Approximately a one-million-fold reduction in infectivity titer is effected in any two to three-day period, and filtration in the course of processing is to be performed sometime between the third and sixth day of formaldehyde treatment. Therefore, any virus released from crystalline or amorphous precipitates, or disaggregated during the last filtration, will still be exposed to an inactivating force of at least three days of formaldehyde treatment. The absence of particles greater in size than can pass the filtration procedure prescribed is considered to be the key to consistently complete inactivation.

If any manufacturer wishes to introduce additional filtration steps beyond those prescribed, or additional treatments that have virucidal effects, these, too, may be employed. But it should not be expected that such additional treatments would create greater safety, since com-

plete inactivation is probably more dependent on the absence of protected virus in aggregates than on the particular inactivating method employed.

TISSUE CULTURE SAFETY TESTS

Subsequent to the last filtration, and at a point in time when it may be presumed that virus infectivity is destroyed—usually six to nine days—a sample is removed from each container in which virus is being inactivated and 500 ml. is tested in tissue culture. It is necessary not only that this sample be free of demonstrable infective virus but that this also be true of a second similar sample that is removed after continued exposure to formaldehyde for an additional three days. With the elimination of particles of the size that will be retained by the filtration procedure prescribed, it may be presumed that, during the additional three-day period, the inactivating effect of the formaldehyde will be the same as that during the first three-day period of treatment, when the rate of inactivation is determined for each lot being tested.

If any sample is found to contain live virus after the application of formaldehyde for a period of time equal to three times the period required to reduce infectivity to just perceptible levels, the prescribed filtration is repeated. Subsequently there must be negative tests for virus on two 500 ml. samples removed three days apart in the course of further processing. If the additional treatment is not successful, a review of the manufacturing process is indicated.

After the two negative tests on 500 ml. samples of the monovalent pools, a trivalent mixture is made and this is also tested in tissue culture, with use of a 1,500 ml. sample. In addition to the specific information required on each lot of vaccine, a continuous record is kept of the outcome of each monovalent strain pool started in each plant, and of each trivalent vaccine pool, to ascertain consistency of performance. A continuing record of the sensitivity of tissue culture tests for the detection of minimal amounts of virus is also maintained. The release of vaccine is contingent upon an analysis of information, not only from each individual lot but from the plant record as well.

MONKEY SAFETY TEST

A further test of safety is made by inoculation of monkeys. The monkey safety test has been shifted from its previous position, where it was applied to the trivalent pool, and has now been adapted for use as the final container test. It is required that a minimum of 5 monkeys be inoculated with samplings of each filling lot and that there be a minimum of 25 monkeys for each manufacturing lot from which these fillings are derived.

Tests made on these animals include tests for potential susceptibility, which requires the demonstration of the absence of circulating antibody in the serum prior to inoculation. In addition, samples of spinal cord segments are removed after 18 days, not only for histological study but also to permit attempts at virus isolation in those cases that are suggestively positive histologically. The need for material for virus isolation attempts arises from the observation that in a number of instances a vaccine lot was considered positive for poliomyelitis virus on the basis of questionable histological findings. The evidence now indicates that such lesions may have been due to a recent or remote encephalitis infection acquired before the test procedure and that some vaccine was discarded that would have been safe for use.

It is now evident that under usual circumstances the monkey safety test is less sensitive than the tissue culture tests prescribed—because the volume that can be tested in tissue culture is greater, and because the strains of virus included in the vaccine are less infective in monkeys than in tissue culture. However, an effort has been made to increase the sensitivity of the monkey test by increasing the susceptibility of the test animal, by increasing the number of monkeys used, and by injecting each animal with vaccine not only intracerebrally but intraspinally and intramuscularly as well.

As an additional safety test, conducted to establish the effect of vaccine administration via the route usually used in man, 12 monkeys are inoculated intramuscularly, each with 3 ml. of undiluted vaccine given in divided doses and at weekly intervals. These monkeys were formerly considered only as part of the potency test but now can be considered as an integral part of the monkey safety-testing scheme. They now receive an additional intracerebral injection and are studied histologically for evidence of lesions in the spinal cord.

POTENCY TESTS

Although the present potency tests and criteria are satisfactory for practical purposes, studies are being made to determine the best methods for increasing the discriminatory power of the test. However, the principle will remain the same, in that a reference vaccine will continue to be used. The potency of this reference standard has been established by test in children who have no antibodies for any of the three types.

A number of suggestions have been made for using different animals or different test plans for establishing potency. The most rational approach is to use a reference vaccine standardized for its performance in children, as is now in effect. Therefore, the problem is one of level of acceptability and of technique for establishing the relationship to the standard of reference. These questions are still under study and will be evaluated as comparisons can be made of the relative potencies of the vaccines used this past summer and their performance in the heavily epidemic areas.

STRAIN COMPOSITION

It is the opinion of the committee that vaccine properly made by the present methods with the Mahoney strain provides an entirely safe immunizing agent. Nevertheless, a change in the type 1 strain is being considered to find a less virulent strain with equal or better immunizing capacity, stability, filterability, and other characteristics of importance in manufacturing.

This subject has been under investigation in a number of laboratories, and it is now evident that there has as yet not been found any type 1 strain that is truly "avirulent" for monkeys when given to adequate numbers of monkeys in the form of undiluted tissue culture fluid, and by all routes, including the intramuscular. Twelve strains of type 1 virus, furnished by investigators particularly interested in this problem, have been shown now

to be of relatively low virulence. However, it still remains to be demonstrated whether any type 1 strains can be considered as completely avirulent when tested in a stringent manner. The present type 2 and 3 strains are in the category of strains of lesser virulence and seem to be less active in producing disease in monkeys than a number of selected type 1 strains that are in the category referred to as "avirulent" or "attenuated."

A study that has required more than a year for completion has revealed that antigenic capacity of equivalent degree is found in a number of the type 1 strains that are characterized by low virulence for the monkey. The problems that now remain to be resolved are those related to suitability for use in production, such as filterability, and especially the question of stability in the presence of the preservatives used.

In addition, information will be required on the resistance of monkeys vaccinated with any new strain to challenge with Mahoney, since field experience has been with a virus containing the latter strain. Information obtained from these studies will permit a decision on the advisability of substituting another type 1 strain for the present Mahoney strain. If another strain is established as superior to Mahoney, it should not be expected that it can be included in commercially distributed vaccine before the 1956 poliomyelitis season. The time when this will be possible cannot be determined at the present time.

SUMMARY

The Technical Committee on Poliomyelitis Vaccine is of the opinion that the principal factors that were involved in earlier manufacturing and testing difficulties have been identified and corrective measures have been taken. Among these factors is the absolute need for removal of particles within which virus may be protected from inactivation by formaldehyde. Provisions have been made to insure as far as possible the removal of such protected particles by suitably spaced filtration procedures. In addition, the safety-test program has been strengthened by improved sampling procedures in the tissue culture tests and by increasing the sensitivity of the monkey safety tests. These measures, together with continuous review of plant production records, assure the safety of released vaccine and should make possible an increased availability of vaccine.

Population Trends.—If the birth rate continues at its present high level, the population of our country will pass the 200 million mark before 1970 and will exceed 220 million by 1975. . . . Currently, there are almost 60,000,000 people in our country under age 20 and nearly the same number at ages 20-44; somewhat more than half that number—about 33,000,000—are in the age range 45-64, and not far from 14,000,000 are at ages 65 and over. Each of these groups will increase, with the most rapid growth expected at the younger and the older ages. . . . The sex ratio as well as the age composition of the population is expected to change in the years to come. . . . Females outnumbered males for the first time in the Census of 1950, but by only 1%. This margin, it is estimated, will grow to 3% by 1975. This trend will reflect the rapid rise in the excess of females over males at the ages 45 and over. At ages 45-64, females will exceed males by more than 10% in 1975; at ages 65 and over, the excess will be about 40%.—Future Population Trends, *Statistical Bulletin*, Metropolitan Life Insurance Company, March, 1955.

CLINICAL NOTES

ORAL THERAPY OF ADRENAL CORTICAL HYPOFUNCTION

USE OF COMBINED FLUDROCORTISONE ACETATE AND HYDROCORTISONE

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The treatment of adrenal cortical hypofunction (Addison's disease) has evolved from the fairly unpredictable precarious control of the patient by the use of oral ingestion of high doses of sodium chloride to a more precise, effective, physiological management based on the use of intramuscular administration of desoxycorticosterone acetate in oil. Pellet implantation of the same steroid soon led to even more exact control of adrenal cortical hypofunction with less frequent administration of the necessary steroid. Infrequent intramuscular therapy has been achieved more recently by administration of aqueous suspensions of other esters of desoxycorticosterone; in particular, the trimethylacetate derivative, which has been used with success, may be administered only once every four weeks in most patients.[1] The use of desoxycorticosterone trimethylacetate, plus supplementary oral therapy with cortisone, until recently, has resulted in optimum therapeutic control of most patients with adrenal cortical hypofunction. The use of oral therapy involving cortisone alone yielded incomplete electrolyte regulation in most patients, although the carbohydrate disturbances were adequately controlled in all. In an attempt to overcome the need for parenteral administration of desoxycorticosterone acetate in the patient with adrenal cortical hypofunction, this substance has been employed in lingual form.[2] In adequate dosage, sublingually given desoxycorticosterone with cortisone given orally has resulted in the satisfactory management of some patients with adrenal cortical hypofunction. The sublingual route of administration gives variable therapeutic results, believed to be due to faulty or irregular sublingual absorption and inability of the patient to prevent most of the active material from being washed down the stomach by salivary secretion.

In an attempt to accomplish effective, well-controlled maintenance of patients with adrenal cortical hypofunction, with less frequent oral administration, fludrocortisone acetate (9-α-fluorohydrocortisone) has been administered to patients with primary and secondary adrenal cortical hypofunction.[3] The recent studies using fludrocortisone acetate have indicated that in addition to its antiphlogistic and corticotropin (ACTH)-inhibitory

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1. Thorn, G. W.; Jenkins, D.; Arons, W. L., and Frawley, T. F.: Use of Desoxycorticosterone Trimethylacetate in the Treatment of Addison's Disease, J. Clin. Endocrinol. **13**: 957-973 (Aug.) 1953.

2. Meier, R.; Gysel, H., and Mueller, R.: Die Wirkung des Desoxycorticosteronglucosids (Percorten Z. G.) auf die Nebennierenninsuffizienz, Schweiz. med. Wchnschr. **74**: 93 (Jan.) 1944.

properties, this compound may induce sodium retention when administered orally or applied topically.[4] Our preliminary studies with this compound in patients with the adrenogenital syndrome showed that in addition to effective inhibition of endogenous corticotropin secretion in doses of 2 to 3 mg. per day fludrocortisone acetate also produced the undesirable effect of profound sodium retention in these patients.[5] Thus, the marked oral effectiveness of the drug in inducing sodium retention and the accompanying edema gave promise for its use in the oral control of patients with adrenal cortical hypofunction. Fludrocortisone acetate together with hydrocortisone has been administered orally to six patients with adrenal cortical hypofunction. Four of these patients were diagnosed as having primary adrenal cortical hypofunction; three due to idiopathic adrenal cortical failure and one as a result of adrenal cortical hypofunction following total adrenalectomy for adrenal cortical hyperfunction (Cushing's syndrome). The remaining two patients have adrenal cortical hypofunction secondary to pituitary failure; one has pituitary insufficiency following radiation therapy for acromegaly and the other secondary to a suprasellar neoplasm. All patients have been maintained on hydrocortisone administered in doses of 10 mg. twice a day and fludrocortisone acetate administered in doses of 0.25 mg. every other day. The control of the patients with oral administration of these two drugs has been accomplished with ease (see table). Adequate control has been achieved for periods of 6 to 14 months. Two of these patients had previously been well maintained on 50 mg. of desoxycorticosterone trimethylacetate administered every fourth week. The effectiveness of the medication has been repeatedly demonstrated by the fact that, when the dose of fludrocortisone acetate was discontinued, adrenal cortical hypofunction of a severe nature intervened within 7 to 14 days after the ingestion of the last dose. Reversal of this induced adrenal cortical hypofunction was readily accomplished upon reinstituting larger oral doses of fludrocortisone, in the range of 0.5 to 1.0 mg. per day, for three to four days.

The derivation of the dose of fludrocortisone was based upon the effectiveness of this steroid in controlling symptoms of adrenal insufficiency and in avoiding manifestations of overdosage using the following three clinical guides: (1) weight gain, (2) the presence of edema, and (3) alteration in blood pressure. Using these three criteria, evidence of overtreatment or inadequate therapy is readily apparent. The dose of fludrocortisone acetate is then promptly and easily altered so that the deviation from the normal is adequately corrected.

Evidence of overdosage with the halogenated steroid occurred when 0.5 mg. of fludrocortisone acetate was administered every day and was characterized by the usual classical disturbances noted after desoxycorticosterone overdosage. These included edema, headache, hypertension, weight gain, and cardiac enlargement. It should be mentioned, however, that these untoward reactions were readily dissipated within three to five days merely by discontinuing treatment with the drug.

The therapeutic range for fludrocortisone acetate, while admittedly small, was sufficient to permit precise management of all patients with adrenal cortical hypofunction. While 0.25 mg. of fludrocortisone acetate administered every other day adequately controlled all the patients, the same dose administered daily invariably produced the overdosage effects outlined above within a period of five to eight days. Discontinuing the dose for three to five days and then resuming the average maintenance dose of 0.25 mg. every other day resulted in subsidence of toxic reaction followed by adequate maintenance in all. It should be noted that one patient, a 50-year-old Negro male (table, case 4), with adrenal cortical hypofunction and evidence of decreased glucose tolerance, was adequately maintained on the dose regimen described above for a period of five to six months with excellent therapeutic effectiveness. Prior to the oral use of medication, this patient required daily intramuscular administration of desoxycorticosterone acetate. However, since he took the parenteral therapy intermittently he was usually under inadequate control and exhibited at times all the signs of moderate adrenal cortical hypofunction. These were characterized by intermittent fainting spells, weakness, and tiredness. Since the patient

Control of Adrenal Cortical Hypofunction with Fludrocortisone Acetate and Hydrocortisone†*

Case No.	Age, Yr.	Sex	Diagnosis	Duration of Treatment, Mo.	Previous Therapy
1	29	F	Secondary adrenal cortical hypofunction (suprasellar neoplasm)	7	None
2	45	F	Primary adrenal cortical hypofunction	13	Desoxycorticosterone trimethylacetate, 50 mg. every mo.; cortisone, 20 mg. every day
3	69	M	Secondary adrenal cortical hypofunction; pituitary irradiation	7	Desoxycorticosterone trimethylacetate, 25 to 37.5 mg. every mo.
4	50	M	Primary adrenal cortical hypofunction	6	Desoxycorticosterone acetate, 2.5 mg. every day
5	29	F	Adrenalectomy for adrenal cortical hyperfunction (Cushing's syndrome)	14	Cortisone, 12.5 mg. twice daily
6	39	M	Primary adrenal cortical hypofunction	12	Desoxycorticosterone trimethylacetate, 50 mg. every 4 to 5 wk.; cortisone, 10 mg. twice daily

* 0.25 mg. given every other day.
† 10 mg. given twice a day.

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has been maintained on therapy orally none of these untoward sequelae have been noted, inasmuch as he has found it convenient to maintain himself as directed and the discomfort of daily injections has been obviated by the oral therapy. It is interesting to note that the increased pigmentation previously observed in this patient had decreased considerably while the patient was receiving the combined halogenated steroid and hydrocortisone therapy.

SUMMARY

The effectiveness of fludrocortisone acetate (9-α-fluorohydrocortisone) and hydrocortisone given orally in the recommended doses proved to be an effective means of controlling patients with adrenal cortical hypofunction (Addison's disease), due to idiopathic insufficiency, surgical ablation, adrenal cortical atrophy, or secondary to pituitary insufficiency. All the patients who have been observed on this combined therapy were adequately controlled, were easily maintained, and showed no signs of hypernatremia when the recommended doses were employed. The method lends itself well to the management of adrenal cortical hypofunction, since there is no pain or inconvenience associated with administration, flexibility of dose is easily accomplished, and steady control of the patient is easily attained without noticeable fluctuation in symptoms of fatigability and muscular weakness.

550 First Ave. (16) (Dr. Kupperman).

USE OF THE IMAGE AMPLIFIER IN CARDIOVASCULAR DIAGNOSIS

Henry A. Zimmerman, M.D., Cleveland

The image amplifier allows one to do fluoroscopy in a lighted room, thereby allowing one to use cone vision rather than rod vision. This does away with the prolonged period of time, 15 to 30 minutes, it takes to secure full rod vision to see clearly detail in the present Patterson 2 B type of fluoroscopic screen. In theory the Fluorex image amplifier is an electronic vacuum tube and works as follows (fig. 1): X-rays, when they are generated by the x-ray tube, pass through the patient and then, in the ordinary fluoroscope, hinge upon the fluoroscopic screen. With the image amplifier, these rays, as they emerge from the patient, are collected on a 5 in. fluorescent screen located just within the inner surface of the glass vacuum image amplifier tube. In close contact with the fluorescent screen is a photoelectric surface. Light produced on the screen by the x-rays is converted into an electronic image surface by the photoelectric surface. Then, by a series of lenses, the electronic image is focused, and, by applying a potential of 30,000 volts, the electrons are accelerated towards the aluminum back phospholayer, which is 1 in. in diameter. At this screen the electrons arrive with increased velocity and are condensed into a smaller area. The resulting image on the output phosphor has been increased in brightness by 200 times that originally produced on the input fluorescent screen. The image is then viewed in true orientation to the patient undergoing examination by the optical system. Regardless of the position of the viewing system, one always sees the image in the same relationship to the patient. Figure 2 shows the optical system in a schematic way.

In my experience, the only disadvantage to this system is the 5 in. area or field that can be viewed at any one time. However, as one gains experience with the instrument, this becomes a minor objection. With the use of the image amplifier the irradiation to the patient and to the personnel can be markedly reduced. This is brought about by reduction in the tube current due to the intense brightness from the image amplification. Usually, good visualization can be obtained at 70 kv. with 2 ma. Either a single-view or a double-view mirror can be used to view the resulting image. With the single-view mirror only one person can view the image at a time.

With the intensity of brightness of the image amplifier one is able to photograph directly from the viewing mirror an image that can be easily photographed. I have

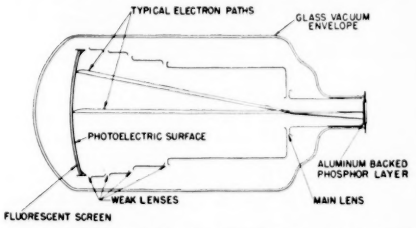

Fig. 1.—Schematic drawing of component parts of the Fluorex amplifying tube.

been taking movies of the screen showing the beating of the heart, as well as pictures of the aorta, the lung fields, and the pulmonary vascular tree. In early 1956, I have been told, the Westinghouse Corporation will market a camera that will be housed directly in the lens system and will give better motion pictures of the beating heart and vessel pulsations. This should make angiocardiography a fascinating, helpful, and useful method of examination, as 36 or 72 frames per second can be taken as compared to the one or two pictures per second that can now be taken with the automatic cassette changer or automatic camera.

ADVANTAGES

I have found the image amplifier is a major advance in the technique of intracardiac catheterization, and, with personal experience with over 1,000 intracardiac catheterizations done with the conventional fluoroscope, I can say that the image amplifier is a major advance in the technique in instrumentation of doing intracardiac catheterizations. It allows one to see the catheter tip at all times, and this is true even in large hearts where, with the conventional system of fluoroscopy, many times the catheter tip was lost from view. This is especially true when the catheter crosses the vertebral bodies. It also

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gives an excellent picture of the position of the catheter in intra-atrial septal and interventricular septal defects. With the use of the image amplifier one actually gets a three-dimensional effect when viewing the catheter, and one can tell exactly whether the catheter is pointing to the side, anteriorly, or posteriorly. This is a difficult task

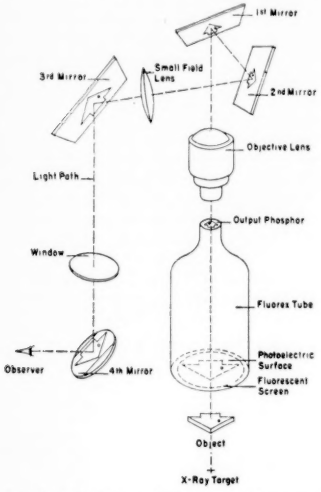

Fig. 2.—Schematic drawing of optical system of image amplifier.

to ascertain, in fact almost impossible under the conventional fluoroscope. One can clearly see the catheter in the lung structures as well. With the catheter in the heart one is able to see clearly the extent of infundibular stenosis by correlating the movement of the catheter with pressure tracings taken simultaneously. Another great advantage of the image amplifier in doing cardiac catheterization as far as the patient is concerned is that he is not put in a dark or light-proof room, and, consequently, much of the fear and apprehension caused by the procedure is done away with. Figure 3 shows an image amplifier unit installed in the cardiovascular laboratory.

Calcification in the ring or in the aortic or mitral valve cusps can actually be visualized with the image amplifier. This has always been a difficult, if not impossible, thing to determine with routine fluoroscopy; and, unless a special technique is used, it is difficult to photograph on an x-ray film. Calcification in the coronary arteries can actually be seen at times, as can calcifications in the wall of the myocardium as seen in healed infarctions of the myocardium. Another use of the image amplifier is to determine the amount, if any, of pulsation and the type of pulsation of the heart, and ventricular aneurysms are much more easily recognized and studied by this method. By varying the kilovoltage and the milliamperage a great deal of contrast can be obtained and the pulsations can be seen and can be readily studied. The old problem of whether pulsation is extrinsic or intrinsic is much more simple to resolve. A man, aged 40, was found to have a suggestive bulge on his left midcardiac border. On viewing this area under the image amplifier, distinct paradoxical pulsations could be seen. The diagnosis of an aneurysm of the left ventricle was readily made. A movie of this pulsation was taken for additional study and permanent record.

Another difficult problem made much easier or resolved by the image amplifier is the determination of pulsations in the pulmonary arteries and in the pulmonary circulation. This, many times, is a crucial point in an infant or a young child in telling whether the vascularity to the lungs is normal, decreased, or increased. This has been a rather simple and easy differentiation to make with the use of the image amplifier, as one can actually clearly see the pulsations and the vigorous indentation of the pulmonary artery. The problem of a pulmonary arterial venous aneurysm in the lungs can be definitely illuminated by direct visualization. Also, in isolated tumors or nodules in the lung, the problem of intrinsic and extrinsic pulsation can usually be resolved quite easily with the image amplifier. Recently a physician, aged 38, had acute chest pain after an auto accident. A chest x-ray showed a mass in the area of the pulmonary artery in the left lobar area. This was interpreted on fluoroscopy, by the radiologist, as an aneurysm of the pulmonary artery. Visualization by the image amplifier showed what appeared to be a cyst with no intrinsic pulsations. Angiocardiography was carried out and proved the mass to be nonvascular. At operation a cyst of the thymus was found and removed. This shows how well one can see with the aid of the image amplifier. Calcium in the ascending aorta in syphilitic aortitis and in the knob of the aorta in arteriosclerosis of the aorta is quite easily delineated and studied.

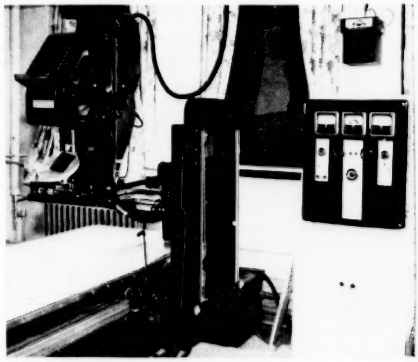

Fig. 3.—Instillation of image amplifier in the cardiovascular laboratory. Note double-view mirror that allows two people to view image at the same time.

SUMMARY

The image amplifier represents a definite advancement in the diagnosis of cardiovascular disease. It allows the use of cone vision, lessens the exposure of the personnel and of the patient to radiation, allows one to carry out intracardiac catheterization with complete vision of the catheter at all times, allows one to determine the extent

and the magnitude of pulmonary blood flow, makes for the easy detection of calcium in the aortic and mitral valves, clarifies the problem of extrinsic and intrinsic pulsations in nodules or masses in the lungs and their difference from vascular lesions, and allows taking of motion pictures of the visualized pathology for more detailed studies.

250 Hanna Bldg. (15).

POCKET MEDICAL KIT

Harry E. Barnett, M.D., Chicago

A light-weight pocket-sized medical kit that contains a selection of closely fitted diagnostic instruments, therapeutic equipment, and medicaments has been assembled. Originally planned for orthopedic surgeons, the kit has been modified so that it can be used by general practitioners, as well as by various types of specialists, as an auxiliary "doctor's bag" or as an emergency kit. It may be useful in routine practice and should be especially valuable for unexpected emergencies.

The leather case (fig. 1) is 5 by 4.5 by 0.75 in., weighs 14.5 oz. when fully outfitted, and contains the following items: (1) steel knife with 2.5 in. blade (fig. 1*A*) in which the knife also serves as a handle for the screwdriver, file, and reflex hammer, which are attached to it by a spring-locking mechanism; (2) a plastic ruler, with a magnifying lens and a flat surface that can be used as a tongue blade (fig. 1*B*), which is 3 in. long and is graduated in inches and centimeters; (3) screwdriver and file (fig. 1*C*), which attach to handle of knife; (4)

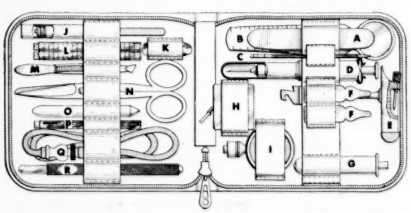

Fig. 1.—Pocket medical kit opened to show arrangement of contents. *A*, steel pocket knife; *B*, plastic ruler with magnifying lens and tongue blade (steel ruler and goniometer may be substituted); *C*, screwdriver and file; *D*, syringe and needle in metal case; *E*, reflex hammer and pin; *F*, ampuls; *G*, flashlight; *H*, tape measure (container for additional medicaments or nasal and aural speculums may be substituted); *I*, stethoscope diaphragm; *J*, disposable cartridge of penicillin (large vial for medicaments or a hemostatic forceps may be substituted); *K*, aromatic spirits of ammonia; *L*, two plastic vials for medicaments; *M*, 3 in. tissue forceps; *N*, scissors; *O*, ballpoint pen; *P*, sterile needle and suture material; *Q*, rubber tubing with earpiece and adapter for stethoscope diaphragm; and *R*, thermometer in metal case.

metal case containing 1 cc. syringe and needle (fig. 1*D*), which may be sterilized and kept covered by a rubber or metal cap; (5) reflex hammer (fig. 1*E*), which inserts into the knife handle to form an adequately weighted and properly balanced instrument (fig. 2*A*) and in which a pin is also contained, readily available for testing sensation, magnetized for use in removing metallic foreign bodies, and equipped with a thin metal ledge underneath for spreading casts; (6) two 1 cc. ampuls of medicaments for injection (fig. 1*F*), such as ephedrine sulfate and morphine sulfate; (7) single cell battery flashlight (fig. 1*G*) in which mercury batteries may be used for longer battery life; (8) steel case with 42 in. cloth tape measure on pushbutton spring return mechanism (fig. 1*H*); (9) stethoscope diaphragm (fig. 1*I*) from which a monaural stethoscope (fig. 2*B*) may be formed by attaching the diaphragm to the rubber tubing with its adapter and earpiece (fig. 1*Q*); (10) disposable cartridge containing 600,000 units of penicillin in aqueous suspension, with covered sterile needle (fig. 1*J*) with which the thermometer case (fig. 1*R*) is used as a plunger for intramuscular injections (fig. 2*C*); (11) perle of aromatic ammonia (fig. 1*K*); (12) two plastic vials with cork stoppers (fig. 1*L*) for orally or hypodermically administered medicaments such as codeine sulfate and morphine sulfate tablets; (13) 3 in. tissue forceps (fig. 1*M*); (14) 4.75 in. scissors (fig. 1*N*) with blunt and pointed ends for removing bandages or sutures; (15) ballpoint pen (fig. 1*O*) that can also be used as a skin-marking pencil; (16) black silk suture material and 2.5 in. straight-cutting needle contained in a sterile packet (fig. 1*P*) or in a sterile glass vial; (17) rubber tubing (fig. 1*Q*), which can be used as a tourniquet, and, with the earpiece and the metal adapter at its opposite ends, it forms a part of the monaural stethoscope (fig. 2*B*); and (18) thermometer in a metal case (fig. 1*R*) that is also used as a plunger for the penicillin tube (fig. 2*C*).

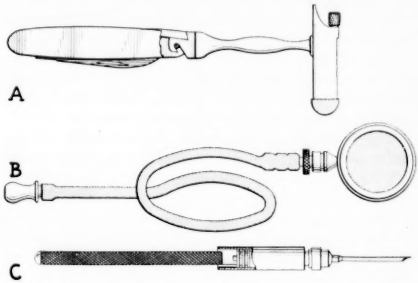

Fig. 2.—Assembled instruments. *A*, handle of knife also serves as handle of reflex hammer. Screwdriver-file attaches in similar manner. *B*, rubber tubing with earpiece and adapter forms monaural stethoscope when attached to diaphragm and may also be used as a tourniquet. *C*, metal thermometer case is used as plunger for disposable penicillin cartridge.

The inside of the leather case is stamped with the outlines of the contents to facilitate reinsertion of the various items into the proper compartments. A zipper encircles three sides of the leather case, and closure is accomplished with speed and ease. The kit is sufficiently compact so that it may be carried at all times in the back trousers pocket or in a coat pocket, in much the same way that a wallet or a pocket secretary is carried. Women physicians may carry it in a handbag. By having the kit

From Michael Reese Hospital.

The pocket medical kit may be assembled by obtaining the proper size leather case and the suggested instruments and vials from surgical or hospital supply companies. The thermometer case, reflex hammer, syringe case, and magnifying lens-ruler have been especially designed for this kit and may be ordered from V. Mueller and Company. The entire kit will be assembled under the name "Pocket Medikit" and may be obtained from V. Mueller and Company, Chicago.

available at all times the physician is prepared for unexpected medical emergencies away from the hospital and office, e. g., at home, on vacations, and at social or sporting events. The contents of the kit may be varied, in keeping with the specialty of the physician. The measuring tape may be replaced by a metal container for additional medicaments or by a nasal and aural speculum. The plastic ruler and magnifying lens may be replaced by a combination steel ruler and goniometer. The ruler is graduated to 4 in., and the goniometer has a range of 180 degrees. The penicillin ampul may be replaced by a large vial for tablets or capsules or by an instrument such as a tuning fork or a hemostatic forceps.

The diagnostic instruments in the kit enable the physician to test sensation and tendon and pupillary reflexes and to measure joint motions, lengths of extremities, and circumference of head and limbs without need for additional apparatus. The bandage scissors is frequently used in hospital rounds, and its availability eliminates the need for the frequent requests that are made for this instrument from hospital nurses. For painful injuries and ailments, the codeine or morphine may be given orally or hypodermically at the time of initial examination or treatment in the home, office, or hospital outpatient department. Sufficient orally administered medicaments may also be left with the patient for relief of symptoms until a prescription can be filled. This is especially important in areas where pharmacies are closed throughout the night. Minor lacerations may be sutured away from the hospital or office by means of the needle, black silk, tissue forceps, and scissors. The monaural stethoscope is efficient in transmitting heart and lung sounds. A rubber earpiece provides better holding power with less possible trauma within the external ear canal. In a noisy room the other ear may be closed by inserting the tip of the finger. The availability of the monaural stethoscope may encourage its more frequent use by physicians who ordinarily do not carry this instrument. A pocket can be added to the outside of the kit to hold a few prescription blanks and important charts, such as antidotes for poisons and dosages of newer drugs.

SUMMARY

A pocket medical kit that contains 24 essential and frequently used diagnostic and therapeutic instruments and medicaments is designed for use by physicians in general practice and in various specialties. Light in weight and compact in size, it can be carried in a pocket, handbag, or glove compartment of a car. Its usefulness to the physician in routine practice and in unexpected emergencies is enhanced by the ease with which it may be carried at all times.

116 S. Michigan Ave.

Radioactive Iodine in Hyperthyroidism.—The use of radioactive iodine in treating patients with hyperthyroidism is based upon two facts: 1. The natural avidity that the thyroid has for collecting iodine, either stable or radioactive. 2. Within the thyroid the radioactive iodine decays by emitting high energy beta rays which penetrate only a few millimeters into the tissue; beta rays act the same as the secondary electrons which are produced by roentgen rays and serve to destroy tissue.—E. M. Chapman, M.D., and Farahe Maloof, M.D., The Use of Radioactive Iodine in the Diagnosis and Treatment of Hyperthyroidism: Ten Years' Experience, *Medicine*, September, 1955.

SPECIAL ARTICLE

HAZARDS OF MODERN DIAGNOSIS AND THERAPY—THE PRICE WE PAY

FRANK BILLINGS MEMORIAL LECTURE

David P. Barr, M.D., New York

"First of all, be sure you do no harm: *Primum non nocere*." In all ages this admonition has been fundamental to the practice of medicine. It applied to the use of all the empirical drugs of ancient and medieval times. Failure to regard it inspired the scathing satires of Molière and was responsible for the research of Pierre Louis and the reforms of Oliver Wendell Holmes and Ignaz Semmelweis. The admonition applied in the age of nihilism, when most of the useless drugs of the past had been abandoned and when Osler could find only a dozen or so to recommend for detailed study by his students. Even then, the few great drugs were as well known for their toxic as for their therapeutic effects. Mercury, the recognized specific for syphilis, could cause salivation and loosening of teeth as well as irreparable renal damage. In slight overdosage, digitalis, so helpful in dropsy, was responsible for frequent discomfort and occasional sudden death. The admonition applied during the last half century, when we saw enthusiastic introduction of many therapeutic measures later recognized as unkind, futile, or hazardous. We can shudder now when we remember outdoor treatment of pneumonia, cold tub baths for typhoid, starving of fevers, and withdrawal of water in cholera. We hesitate to think of the harm unwittingly done by the use of aminopyrine, cinchophen, and dinitrophenol. Their wrongful use and many other errors plague our recent past and make us insecure in our present judgments.

Today, when multitudes of new and relatively untried diagnostic and therapeutic procedures form an integral part of the practice of medicine, the admonition "Be sure you do no harm" applies more than ever before. Diagnostic methods formerly simple are becoming increasingly complex and formidable. Sanctioned practice includes use of injections of organic substances for visualization of liver, gallbladder, urinary tract, bronchi, lungs, heart, blood vessels, and spinal canal; air injections for visualization of the brain; cystoscopies, bronchoscopies, esophagoscopies, and gastroscopies; punctures with large needles of bone marrow, liver, and even of lungs, spleen, and kidneys; and catheterization of the great vessels and heart. Therapeutic preparations are confusingly numerous and varied. In the lists of 1953, more than 140,000 medicaments were available to practitioners, and 14,000 new preparations were added during the year. Accretion is still far greater than deletion, although it has been estimated that perhaps 90% of drugs now in common use have been introduced within the last 25 years.[1]

Read before the Section on Internal Medicine at the 104th Annual Meeting of the American Medical Association, Atlantic City, June 8, 1955.

1. Brown, E. A.: Problems of Drug Allergy, J.A.M.A. **157**:814 (March 5) 1955.

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Although incalculable benefits have come to mankind with the introduction of these newer diagnostic and therapeutic procedures, hazards of medical management have at the same time enormously increased. Not one of the occasionally indispensable diagnostic tests may be undertaken without risk. The simplest as well as the most complicated possesses inherent danger. Infection may be introduced by a needle; sudden death may follow the intravenous administration of such a relatively inert substance as dehydrocholic acid (Decholin). Furthermore, no agent that can modify the internal environment or organic integrity of the body can be used without hazard. As yet no drug has been found with a single action, and no human body with a single reaction. Risks accompany the use even of those remedies that are regarded as safest. Acetylsalicylic acid is usually given with apparent impunity; yet coryza, bronchospasm, conjunctival injection, eruptions, thrombocytopenic purpura, fever, shock, cardiovascular collapse, and death have followed its use.[2] Although penicillin is correctly regarded as the least toxic of potent chemotherapeutic agents, Welch, Lewis, and Kerlan estimated that from its use 100 to 200 acute anaphylactic-like reactions occur each year.[3]

These accidents, risks, and dangers may be regarded as the price that we, as responsible physicians, must pay for the inestimable benefits of modern diagnosis and therapy. They are the hazards to which, with best intent and most correct practice, we must occasionally subject our patients. In the following discussion about the price we must pay for modern management of disease, care has been taken to exclude from consideration all examples of carelessness, misconduct, malpractice, as well as the use of nostrums, patent medicines, and other unacceptable or condemned remedies. It is believed that all the herein-cited accidents and misfortunes may result on occasion even with enlightened thoughtful use of diagnostic and therapeutic measures by conscientious and well-informed physicians earnestly trying to help their patients. Since even a list of possible dangers would be too cumbersome, examples have been chosen arbitrarily as illustrative of the extent and variety of hazards in our daily work. For orderly presentation, they have been arranged under headings representative both of types of unfavorable responses and of special accidents that may arise in the use of single agents or groups of agents having similar actions.

ACCIDENTAL DRUG INTOXICATION

One of the great hazards in the use of potent drugs is their inherent toxicity that, with wide individual variation, will develop intoxication in any patient if the dose is large enough. An outstanding example is digitalis, in the use of which only a narrow margin separates therapeutic and toxic dosage. In spite of the availability of highly purified crystalline preparations, the dangers of the drug appear to be greater now than ever before. This situation can be attributed to several factors. Among them are dogmatic insistence upon oversimplification of dosage and prevalence of rapid digitalization and intravenous administration. Other factors are related to the use of digitalis in older patients in whom life has been prolonged by other measures and in whom the myocardium is more susceptible to the action of the drug because the failure is more severe. Also implicated is the variable responsiveness to digitalis that results from increasing dependence in cardiac therapy on the manipulation of electrolytes by restriction of sodium in the diet, the stimulation of sodium excretion by mercurial diuretics, and the use of ammonium chloride, cation exchange resins, carbonic anhydrase inhibitors, and cortisone.[4] Whatever may be the factors, the use of digitalis constitutes today one of the most frequent causes of "iatrogenic" disease. Toxic actions are illustrative of the dangers that may be encountered with less well studied and newer drugs. Similar hazards are inherent in the administration of such drugs as scopolamine, curare, and bishydroxycoumarin (Dicumarol), the dangers of which are less important only because these drugs are less frequently used.

MODIFICATION OF INTERNAL ENVIRONMENT

Although the homeostasis of the body is modified by a vast number of drugs in ways but vaguely appreciated, it is most strikingly changed by parenteral injection of fluids of variable composition and by agents that modify the rate of excretion of water, electrolytes, and other substances through kidneys or intestine. Modifications that can be produced by these measures are alarming in variety and degree and only partially predictable. Sodium may be seriously depleted, not only by the sweating that results from hot weather and by restriction of sodium in the diet, but by mercurial and other diuretics.[5] Potentially serious hypopotassemia, with its muscular weakness and cardiac complications, may be promoted by many factors, including acidosis, intravenous injection of glucose and insulin, and the administration of ammonium chloride, commonly used resins, a carbonic anhydrase inhibitor, cortisone, or desoxycorticosterone acetate.[6] Alkalosis and hypochloremia with their baffling nervous and mental symptoms may follow administration of large amounts of alkalis, such as sodium bicarbonate and sodium lactate or may result from gastric suction with removal of excessive amounts of gastric hydrochloric acid.[7] Severe hyperchloremic acidosis with its simulation of cerebral vascular accidents, terminal renal disease, and other forms of acidosis may accompany treatment of heart failure with mercurial diuretics.[8] Acidosis with many troublesome symptoms may follow the administration of ammonium chloride.[9]

These and many other reactions from the use of parenterally given fluids and diuretics are illustrative of the general principle that no modification of homeostasis

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can be simple and that the manipulation of one factor by drugs or fluids may have unpredictable and subtle effects on another.

INTRODUCTION OF INFECTION

Entry by needles or other instruments into tissues, vessels, or cavities of the body always involves some risk of infection. After cystoscopy bacteremia is not infrequent, and infection of the urinary tract, with or without septicemia, is an occasional complication. It is suspected that the virus of homologous serum jaundice has been introduced by insufficiently sterilized needles in punctures of fingers, ears, or veins. Transfusions may be the source of serious blood stream infections. Recent reports have shown that blood banking, a practice that has saved many lives by making blood readily available, has also introduced new hazards of infection. The possibility of carrying bacteria into the blood during its removal from the donor can not be entirely excluded, and, in rare instances, relatively nonpathogenic bacteria of the Pseudomonas group may accumulate in blood stored at icebox temperature in amounts sufficient to cause fatal intoxication.[10] A much more frequent accident from transfusions is the introduction of the virus of homologous serum jaundice. It is known that a healthy person with no history of hepatitis or jaundice and exhibiting no clinical or laboratory evidence of liver disease may nevertheless carry the virus in his blood. Danger is great from transfusions of whole blood and is much greater from the use of plasma from plasma pools. Since there is at present no known effective method of prevention, hepatitis must be regarded as one of the calculated risks of blood transfusion.[10a]

ALLERGIC REACTIONS

More than 500 separate drugs are known to cause allergic reactions.[1] The unfavorable effects may be expressed by simulation of serum sickness, by the more violent reactions of anaphylaxis, or by affection of one or more of the organs of the body: the skin, bone marrow, lungs, liver, or kidneys. There is great variety and separateness in the response of individual patients to individual drugs. While many drugs cause reactions, there are only a few ways in which the body can react. Thus, the function of bone marrow can be seriously disturbed in an almost identical manner by antibiotic agents, sulfonamides, antihistaminic agents, antimalarials, barbiturates, some heavy metals, amphetamine, urethane, phenylbutazone, glyceryl trinitrate (nitroglycerin), meperidine hydrochloride, and thiouracil.[8] Drugs causing urticaria and other allergic skin reactions are still more numerous. Injury of the liver by action thought to be allergic is encountered with increasing frequency and has been reported after the use of chlorpromazine (Thorazine),[11] pyrazinamide,[12] methyltestosterone,[13] phenylbutazone,[14] and other agents whose toxic or idiosyncratic reactions are as yet only partially evaluated.

SPECIAL INSTANCES OF INTOXICATION

Antibiotics.—Because of the enormous usage of antibiotics, intoxication assumes a prominent role even though it may be statistically infrequent. No antibiotic has as yet been found free from hazards or disadvantages. The side-actions and toxic effects of penicillin have been numerous. In addition to the sometimes fatal anaphylactic responses,[15] there are eruptions of the most diverse type, all manifestations of serum sickness, disturbances of renal function, hypotension, cardiovascular collapse, or unconsciousness; there may be hematological disturbances as various as anemia, agranulocytosis, eosinophilia, and hypothrombinemia.[2]

In their entirety, toxic reactions attributable to antibiotics and chemotherapy are impressive.[16] Anaphylactic reactions have been reported occasionally from most, if not all, of the agents derived from fungi. Hepatic dysfunction has followed the use of streptomycin, chlortetracycline (Aureomycin), oxytetracycline (Terramycin), and chloramphenicol. Renal impairment has been noted after streptomycin therapy and appears as a toxic effect following administration of bacitracin, neomycin, and polymyxin. The incidence of aplastic anemia and other hematological dyscrasias developing during the use of chloramphenicol has been subjected to searching investigation by Welch and associates.[2] Difficulties inherent in attribution of toxic action to any drug appeared in their study. In this instance, as in others, history of exposure did not establish proof of causation of unfavorable symptoms. While circumstantial evidence indicated that administration of chloramphenicol was followed by an increased incidence of bone marrow depression, statistical proof of its action was not established, and it remained questionable whether chloramphenicol is essentially more toxic than some other antibiotics whose record of toxicity has excited less attention. Unfavorable actions of sulfonamides that in some measure have been lost to view because of their replacement by other agents in many therapeutic situations are numerous and include fever, eruptions, blood dyscrasias, and neuritis.

Not the least of the toxic symptoms associated with antibiotics is irritation of the gastrointestinal tract that is particularly severe after the use of tetracycline derivatives. Not infrequently, administration of these drugs has been followed by invasion of the intestinal tract by drug-resistant staphylococci causing infection that may be fatal unless administration of the offending drugs is discontinued and erythromycin therapy instituted.[17] Less

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serious effects of antibiotics are the development of mycotic infections in the mouth and in the gastrointestinal tract and of vitamin deficiencies attributable to bacteriostatic action on the normal intestinal flora.

Cortisone, Hydrocortisone, and Corticotropin (ACTH).—Unfavorable reactions from the long-term administration of cortisone, hydrocortisone, and corticotropin (ACTH) are well known. In addition to the obesity, hypertension, hirsutism, and osteoporosis of adrenal cortical hyperfunction (Cushing's syndrome), reactions may include increased susceptibility to infection, hindrance of wound healing, or exacerbation of ulcers in the stomach and intestinal tract. A considerable danger results also from rapid withdrawal of the agents after prolonged use.[18]

Antihistaminics.—The antihistaminic agents, of which there are now no less than 20, must be regarded as serious causes of intoxication, more particularly since their use is chiefly among patients who are not seriously ill. Several fatalities have been attributed to them. Their side-effects, especially those observed on the nervous system, are so numerous and sometimes so severe as to suggest that their use is actually more hazardous than that of sulfonamides and antibiotics employed for the most part in treatment of infections that might otherwise result in death.[19]

Phenylbutazone and Chlorpromazine.—Phenylbutazone is a congener of aminopyrine, and its toxic effects, particularly on bone marrow, are reminiscent of the unfortunate experiences with aminopyrine. Side-effects are numerous and sometimes serious; they include edema, eruptions, and unfavorable actions on the gastrointestinal tract, hematopoietic system, central nervous system, and heart.[20] Fatal hepatitis has recently been reported.[14] It is perhaps illustrative of illogical practice that the use of aminopyrine was sharply limited by disclosure of rare instances of intoxication, while the use of a phenylbutazone may now be actually increasing. Current brochures describing clinical uses of chlorpromazine under the name of Thorazine mention its applicability for relief of nausea and vomiting, mental and emotional disturbances, alcoholism, intractable pain, and hiccoughs. Suggestions are included for its use in correction of nausea and vomiting caused by other drugs, such as diethylstilbestrol (Stilbestrol), digitalis, nitrogen mustards, broad-spectrum antibiotics, and general anesthetics. It is thought to be good also for nausea and vomiting in pregnancy. In the psychoses the drug is now being used in large doses at a time when the danger of hidden toxicity, always inherent in new and potent drugs, has been only partially evaluated. Reports of agranulocytosis following its use are in the literature.[22] The incidence of jaundice and disturbed liver function is subject to variable estimates; their nature and seriousness may be judged only by preliminary observations.[11]

HIDDEN AND GENERAL DANGERS

The history of new drugs indicates that not all their potential dangers are immediately apparent. Examples of this are the experiences with cinchophen and aminopyrine. Many years of continued use of each of these drugs elapsed before the unfavorable actions could be established. Still more difficult to evaluate is the inference that past use of drugs may be responsible for the late appearance of symptoms or for development of a chronic disease such as lupus erythematosus or periarteritis. It seems inevitable that with the increasing potency of drugs and the multitude of different reactions caused by single agents that there could be production of syndromes strikingly like those of previously known diseases. Recently, drugs have been introduced for specific purposes that may actually produce complete syndromes.

An outstanding example is the state that develops with some frequency during treatment for hypertension by hydralazine (Apresoline) hydrochloride.[23] In its complete form the syndrome may be manifested by fever; prostration; pleural, pericardial, and joint effusions; skin sensitivity to ultraviolet light; and erythematous eruptions. There may also be lymphadenopathy and splenomegaly. Laboratory studies may show decreased serum albumin and increased alpha and gamma globulin levels, increased sedimentation rate, transient false-positive tests for syphilis, and anemia and leukopenia. Sometimes L. E. cells may be demonstrated in peripheral blood and bone marrow. Histologically abnormal collagen has been seen in muscle and skin. In one case a typical rheumatic nodule was noted, and in another lymphorrhea in muscle resembling that of rheumatoid arthritis was observed. Thus a condition produced by action of a drug closely parallels the clinical, serologic, and histological picture of a serious collagen disease. Only in its reversibility and the relative infrequency of L. E. cells and renal manifestations does it deviate from spontaneously occurring lupus erythematosus disseminatus.

Such a striking simulation of disease as a side-action of a single drug lends some weight to observations that have led to suspicion that adverse action of drugs might be implicated in the pathogenesis of collagen diseases. Evidence of such a relationship has previously been less convincing for lupus erythematosus than for periarteritis nodosa, in which the work of Rich in animals has demonstrated morphological identity of lesions produced by serum sickness and sulfadiazine and the polyarteritic lesions of rheumatic fever and clinical periarteritis nodosa.[24]

DANGERS FROM MULTIPLE PROCEDURES

The danger in diagnostic and therapeutic procedures comes not so much from the use of individual tests or drugs as from the multiplication of these measures now

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commonly used in so-called diagnostic surveys and therapeutic regimens in which each symptom receives some remedy. For patients in a diagnostic clinic or in the ward of a modern hospital, the application of 20 or 30 diagnostic tests is not uncommon. Many of these tests may be repeated on several occasions. A seriously ill patient or one who has been subjected to a major operation may receive 20 to 40 different drugs in addition to numerous mechanical procedures. His management may actually require use of anesthetics, sedatives, narcotics, antibiotics in variety, phenylephrine (Neo-Synephrine) hydrochloride, arterenol, digitalis, diuretics, bishydroxycoumarin, cortisone, transfusions, infusions, and finally antihistaminics, either for the correction of symptoms of his disease or to combat the toxic manifestations of other drugs. Since such combinations of measures and medicines are frequent, it is not surprising that iatrogenic disturbances are frequent.

In a medical service in a great hospital, over a period when approximately 1,000 patients were admitted, more than 50 major toxic reactions and accidents consequent to diagnostic or therapeutic measures were encountered. Many of the incidents and accidents took place before the patient's admission to the hospital and provided the occasion for hospitalization. Others developed in the course of diagnosis and treatment in the wards. The survey was not systematic or complete, and some instances of major intoxication may have been omitted from the list. The survey took no account of such factors as inconvenience and expense to the patient, prolongation of hospitalization, minor intoxications, or hidden and delayed reactions.

There were several cases of accidental intoxication, and among these no less than 10 instances of digitalis poisoning. In one of these, ventricular fibrillation and death occurred. Serious hematuria developed in one patient from the use of bishydroxycoumarin; in another there was methemoglobinemia following the use of bismuth subnitrate; one patient was admitted with mental confusion from bromism and another for delirium following therapy with atropine. There was one idiosyncratic response to diphenylhydantoin (Dilantin) sodium and a case of hypotension and vomiting from the use of pentolinium (Ansolysen) tartrate as an antihypertensive agent. There were four examples of reaction to penicillin; one of these was anaphylactic in nature and of such severity that death was averted only by prompt treatment. Two cases of hepatic dysfunction developed during use of pyrazinamide. An acute hemolytic reaction occurred during the use of sulfadiazine. One case of monilial stomatitis and one of severe enterocolitis developed during treatment with tetracycline derivatives.

Three instances of intoxication followed the use of corticotropin and cortisone. One resulted in the formation of multiple gastric ulcers with perforation, hemorrhage, and fatal outcome. Four instances of troublesome acidosis followed use of ammonium chloride. Sensitization reactions were encountered from a number of agents. Eruptions developed from oxytetracycline, pentolinium tartrate, and myleran (1:4-dimethanesulphonyloxybutane); neutropenia from phenylbutazone; agranulocytosis from aminopyrine; and thrombocytopenic purpura from propylthiouracil.

Accidents were not limited to therapeutic procedures. In one instance, a severe blood stream infection following cystoscopy was controlled with difficulty with antibiotics. One young woman, the wife of a physician, died in acute anaphylactic shock 15 minutes after intravenous injection of dehydrocholic acid for determination of circulation rate. Another young woman, a nurse with a congenitally thin sternum, died from cardiac tamponade immediately after a sternal puncture.

In the aggregate, unfortunate sequelae and accidents attributable to sanctioned and well-intentioned diagnosis and therapy were noted in about 5% of patients admitted to medical wards. In this sense, iatrogenic disease could be regarded as one of the commonest conditions encountered during the period.

CONCLUSIONS

It is realized that such concentration on toxic and unfavorable actions of diagnostic and therapeutic measures creates a distorted picture that can be corrected only by detailed recitation of simultaneous benefits. The discussion has been offered without nihilistic intent and with grateful recognition of the triumphs of modern diagnosis and therapy. Choice of topic developed from an ever-growing conviction of the extent and variety of dangers intrinsic in the medical practice of today and from a desire to suggest that discriminating selection of measures may be more important than unreflective completeness. It is suggested that it may be as useful to the patient that his physician know when not to treat as when to treat and that the use of potentially dangerous agents for trivial or inconsequential complaints may not be justifiable. Only by such discipline and understanding may we, as physicians, avoid doing unnecessary harm and minimize the price we and our patients pay for modern management of disease.

525 E. 68th St. (21).

CHEMICAL LABORATORY

TESTS AND STANDARDS FOR NONOFFICIAL DRUGS

The following monographs were developed by the Chemical Laboratory for drugs that had been evaluated prior to Jan. 1, 1955, by the Council on Pharmacy and Chemistry. These monographs have not been published previously and are among the last of the Tests and Standards of the monographs that had been prepared during the former "acceptance" program of the Council on Pharmacy and Chemistry.

WALTER WOLMAN, Ph.D., *Director.*

Erythromycin Glucoheptonate.—Erythromycin glucoheptonate is the α-glucoheptonate salt of erythromycin, an antibiotic produced by the growth of Streptomyces erythreus Waksman. The chemical structure of erythromycin glucoheptonate has not been established.

Physical Properties: Erythromycin glucoheptonate is a white, crystalline, odorless powder. It is freely soluble in alcohol and in water, and practically insoluble in ether. The pH of a 2% solution is 6.0-7.5.

Identity Tests: Transfer to a test tube about 10 mg. of erythromycin glucoheptonate and add about 2 ml. of hydrochloric acid: a yellow color appears and changes to dark greenish yellow.

Transfer to a test tube about 5 mg. of erythromycin glucoheptonate and add 5 ml. of sulfuric acid: a red-brown color appears.

Transfer to a separatory funnel about 0.1 gm. of erythromycin glucoheptonate, and add 10 ml. of water, 1 ml. of ammonia T. S., and 10 ml. of chloroform. Shake the mixture and allow it to separate. To the aqueous solution add 10 ml. of alkaline cupric tartrate T. S. and heat to boiling: a yellow-orange precipitate of cuprous oxide forms.

Transfer to a test tube about 50 mg. of erythromycin glucoheptonate and dissolve it in about 5 ml. of water. Add about 5 ml. of a saturated solution of picric acid, allow to stand for about 10 min., and filter. Wash the precipitate with water and dry in a vacuum desiccator: the picrate formed melts at 168-175° (*Caution! Picrates may be explosive*).

A 2% solution of erythromycin glucoheptonate in water is levorotatory.

Purity Tests: On about 0.5 gm. of erythromycin glucoheptonate, accurately weighed, run a *U. S. P. Karl Fischer test for water:* the amount of moisture does not exceed 5.0%.

Char about 0.5 gm. of erythromycin glucoheptonate, accurately weighed, cool the residue, add 1 ml. of sulfuric acid, heat cautiously until evolution of sulfur trioxide ceases, ignite, cool, and weigh: the residue does not exceed 1.0%.

Assay: (Erythromycin) Transfer to a 100 ml. volumetric flask 32.5 mg. of erythromycin glucoheptonate, accurately weighed, fill to the mark with water, and mix. Transfer to a 500 ml. volumetric flask 2 ml. of the solution and fill to the mark with 0.1 M phosphate buffer, pH 8.0, to obtain the assay preparation containing in each milliliter the equivalent of about 1 mcg. of erythromycin as the glucoheptonate. Proceed as directed in the *U. S. P. erythromycin microbial assay*. The amount of erythromycin activity is not less than 85.0% of the theoretical amount.

Dosage Forms of Erythromycin Glucoheptonate

POWDER. *Identity Tests:* The powder responds to the identity tests for the active ingredient in the monograph for erythromycin glucoheptonate.

Assay: (Erythromycin) Transfer the entire contents of the container to a 100 ml. volumetric flask and add sufficient distilled water to make 100 ml. Mix thoroughly and transfer an aliquot portion, equivalent to 25 mg. of erythromycin, to a second 100 ml. volumetric flask, fill to the mark with water, and mix. Transfer to a 500 ml. volumetric flask 2 ml. of the solution and fill to the mark with 0.1 M phosphate buffer, pH 8.0, to obtain the assay preparation containing in each milliliter the equivalent of about 1 mcg. of erythromycin as the glucoheptonate. Proceed as directed in the *U. S. P. erythromycin microbial assay*. The amount of erythromycin activity is not less than 85.0% of the labeled amount.

Eli Lilly & Company cooperated by furnishing scientific data to aid in developing this monograph.

Erythromycin Stearate.—Erythromycin stearate is the stearate salt of erythromycin, an antibiotic produced by the growth of Streptomyces erythreus Waksman. The chemical structure of erythromycin stearate has not been established.

Physical Properties: Erythromycin stearate is a white or slightly off-white, practically odorless, crystalline powder. It is soluble in alcohol and in ether, and is practically insoluble in water. The pH of a 1% slurry is in the range of 6.0-11.0.

Identity Tests: Transfer to a test tube about 10 mg. of erythromycin stearate and add about 2 ml. of hydrochloric acid: a yellow color appears and changes to a dark greenish yellow.

Transfer to a test tube about 5 mg. of erythromycin stearate and add 5 ml. of sulfuric acid: a red-brown color appears.

Transfer to a 50 ml. glass-stoppered Erlenmeyer flask about 0.5 gm. of erythromycin stearate and suspend it in about 10 ml. of water. Add 15 ml. of a saturated solution of picric acid and shake the mixture for 1 hour on a mechanical shaker. Centrifuge the mixture, decant the supernatant solution, and wash the precipitate twice with water, centrifuging the mixture and decanting the supernatant liquid after each wash. Recrystallize the precipitate from diluted alcohol and dry at 105°: the precipitate melts at 168-172° (*Caution! Picrates may be explosive*).

A 2% solution of erythromycin stearate in alcohol is levorotatory.

Purity Tests: Accurately weigh about 0.5 gm. of erythromycin stearate and determine the water content by the *U. S. P. Karl Fischer method:* the amount of moisture does not exceed 5.0%.

Char about 0.5 gm. of erythromycin stearate, accurately weighed, cool the residue, add 1 ml. of sulfuric acid, heat cautiously until the evolution of sulfur trioxide ceases, ignite, cool, and weigh: the residue does not exceed 2.0%.

Assay: (Erythromycin) The erythromycin used in the preparation of erythromycin stearate, assayed by the microbiological method, contains not less than 85% of the theoretical amount.

Dosage Forms of Erythromycin Stearate

SUSPENSION. *Identity Tests:* Transfer to a 125 ml. separatory funnel an amount of suspension equivalent to about 0.5 gm. of erythromycin. Extract with three 25 ml. portions of chloroform, wash the combined chloroform extracts with 10 ml. of water, and evaporate the chloroform layer to dryness. The residue responds to the identity tests for the active ingredient in the monograph for erythromycin stearate.

Assay: (Erythromycin) Transfer to a 100 ml. volumetric flask an amount of suspension, accurately measured, equivalent to about 25 mg. of erythromycin, add 40 ml. of methanol, mix, fill to the mark with water, and mix again. Transfer to a 500 ml. volumetric flask 2 ml. of the solution and fill to the mark with 0.1 M phosphate buffer, pH 8.0, to obtain the assay preparation containing in each milliliter the equivalent of about 1 mcg. of erythromycin. Proceed as directed in the *U. S. P. erythromycin microbial assay*. The amount of erythromycin is not less than 85.0% of the labeled amount.

TABLETS. *Identity Tests:* Powder about 10 tablets. By trituration extract an amount of powder equivalent to about 0.5 gm. of erythromycin with 50 ml. of chloroform and evaporate the filtered chloroform extract on a steam bath. The residue responds to the identity tests for the active ingredient in the monograph for erythromycin stearate.

Assay: (Erythromycin) Transfer to a 100 ml. volumetric flask an amount of powdered tablets, accurately measured, equivalent to about 25 mg. of erythromycin, add 40 ml. of methanol, mix, fill to the mark with water, and mix again. Filter the suspension through a dry filter paper and discard the first 15 ml. of the filtrate. Transfer to a 500 ml. volumetric flask 2 ml. of the subsequent filtrate, fill to the mark with 0.1 M phosphate buffer, pH 8.0, to obtain an assay preparation containing in each milliliter the equivalent of about 1 mcg. of erythromycin. Proceed as directed in the *U. S. P. erythromycin microbial assay*. The amount of erythromycin is not less than 85.0% of the labeled amount.

Abbott Laboratories cooperated by furnishing scientific data to aid in developing this monograph.

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MODERN ANTIBACTERIAL AGENTS

New antibacterial agents have appeared so fast in the last 20 years that it has been difficult for the average practitioner to keep abreast of developments and to avoid confusion. One of the most troublesome problems is the prophylactic use of such agents. Weinstein [1] has sorted out the indications for such use, the commonest of which is the protection of healthy persons or groups from a specific infection to which they have been exposed or are in danger of being exposed. This has been most successful against beta-hemolytic streptococci and Neisseria gonorrhoeae for which penicillin is best, Neisseria meningitidis for which either penicillin or sulfadiazine is best, and Shigella dysenteriae for which sulfadiazine is best. If the drug of choice is contraindicated or the causative organisms are resistant to it, one of the tetracycline group should be used. Chemoprophylaxis has also been used to prevent secondary infection in a patient acutely ill with a disease for which chemotherapy is not effective, but this has not been generally effective and may even increase the likelihood of complicating bacterial infections with organisms not inhibited by the agent used.

A third common use of chemoprophylaxis is to reduce the risk of infection in patients with chronic disease. This has been most successful in patients with rheumatic fever who appear to be benefited by prolonged treatment with benzathine penicillin. Patients with chronic heart disease may be given prophylactic doses of penicillin for a few days preceding and following the extraction of a tooth. One of the most common uses of chemoprophylaxis is to inhibit the spread of a localized infection in patients who have had accidental or surgical trauma, and it has been commonly used in patients undergoing "clean" operations, especially cataract operations, in which the risk of infection is great. Despite the popularity of this procedure, the results have been negligible in the few controlled series that have been investigated and the risk of superimposed infections is great. In any contemplated use of chemoprophylaxis, it is important to consider only those advantages that are well established and to weigh these against such known dangers as drug allergy, the normal toxicity of the drug to be used, possible disturbances to normal metabolism, and the superimposed infections. Ordinarily use of such agents should not be continued for more than five days.

Hypersensitivity to both sulfonamides and antibiotics has become all too common as a result of widespread exposure. It is estimated that allergy to penicillin is now found in 10% of the population.[2] Deaths from this cause are not uncommon. These drugs are not only used extensively by physicians but also the pharmaceutical companies show an increasing tendency to incorporate them in nose drops, throat sprays, eye drops, troches, chewing gum, and ointments in amounts that are probably ineffective therapeutically but are undoubtedly allergenic.[3] Furthermore, due to the common use of antibiotics in animal husbandry, small amounts are now present in the meat, eggs, milk, and cheese that reach our tables. Because the allergic reaction to these drugs is frequently characterized by fever and rash, it may be difficult to distinguish between the drug reaction and the disease for which it is given. Fortunately in acutely ill patients strong physiological insults may cause the tissues to be unresponsive to allergenic stimuli. An acute infection may cause an increase in adrenocortical activity, thereby suppressing an allergic reaction. If, however, a fever persists when the patient's general condition has improved and the physical signs of his disease have cleared, this is not an indication for increasing the dose of a chemotherapeutic agent but rather a reason to discontinue its use.

There is some disagreement as to whether a physician should ever prescribe a specific drug without laboratory identification of the causative organism. Selection of the best drug to use often depends not only on such an identification but also on tests of the sensitivity of the organism to the drug. The clinician's dilemma is that, if his treatment is to have its greatest effect, it must be given early in the course of the disease, and if he waits for laboratory tests he may lose much valuable time and incur the wrath of the patient or the patient's family. McDermott [4] believes that the only solution at present is for the physician to make a tentative diagnosis based on a careful evaluation of his clinical findings, take speci-

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2. Yow, E. M.: A Reevaluation of Sulfonamide Therapy, Ann. Int. Med. **43**: 323-332 (Aug.) 1955.
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5. Lepper, M. H.: Microbial Resistance to Antibiotics, Ann. Int. Med. **43**: 299-315 (Aug.) 1955.

mens for culture before starting treatment, select the drug most likely to benefit the patient if his tentative diagnosis is correct, and give this drug in adequate doses. If laboratory results indicate that his diagnosis was in error, he can change the medication and be no worse off than if he had waited with his hands folded for the laboratory report. McDermott also believes that the results of disk plate sensitivity tests are so often unreliable as to be of doubtful value.

Lepper,[3] in a detailed study of microbial resistance to antibiotics, suggests methods of minimizing the development of such resistance: chemotherapeutic agents may be used in combination; new drugs can be introduced; antibiotics of limited scope should be used and only in minimal effective doses. These and other measures will aid in maintaining the usefulness of many of our most powerful therapeutic agents. With the troublesome problems of hypersensitivity, drug resistance, and superimposed infections, interest in the sulfonamides is being revived.[2] In the period following the introduction of penicillin, new and safer sulfonamides have been synthesized. Most of the serious complications such as hematological disorders were reduced to less than 0.1% by the use of sulfadiazine. More recently sulfisoxazole, which is 10 times as soluble as sulfadiazine, has been introduced. Fortunately, combining sulfonamides produces an additive bacteriostatic effect, but the drugs combined have their independent solubilities in the urinary tract. This reduces the danger of renal tubular irritation and blockage. Because sulfonamides produce less drastic changes in the normal flora of the body than do the antibiotics, their use is attended by less risk of superimposed infections. In many diseases sulfonamides are as effective as antibiotics. In some diseases the combination of an antibiotic and a sulfonamide produces the best results. From these observations it should be abundantly clear that in medicine nothing is static. Research investigators continue to provide us with better means of combatting disease, but the clinician must still bring judgment and skill to bear to obtain the best results and above all to keep these new drugs from falling into disrepute.

E. ROGER SAMUEL, M.D.

THE GENERAL PRACTITIONER'S AWARD

Dr. E. Roger Samuel of Mount Carmel, Pa., was named the General Practitioner of the Year at the opening session of the House of Delegates of the American Medical Association November 29 during the Ninth Clinical Meeting in Boston. A general practitioner for 35 years, the 66-year-old physician was nominated by the Medical Society of the State of Pennsylvania, after original sponsorship by the Northumberland County Medical Society and the Mount Carmel Rotary Club. His nomination carried with it testimonials from patients, colleagues, fraternal and civic groups, and churches.

Dr. Samuel, who practices medicine in the Pennsylvania town where he was born, was chosen for the honor by an unidentified A. M. A. committee from candidates nominated by each of the state medical societies, which in turn received nominations from county medical societies. He has continuously devoted time and effort to public service and has served diligently and enthusiastically in civic and religious groups covering a wide range of interests. A 33rd degree Mason, he has been trustee, treasurer, and Sunday school teacher of the First Methodist Church, president of the Community Concert Association, president of the Northumberland County unit of the American Cancer Society, medical advisor of the tuberculosis and health committee, and member of the board of the Mount Carmel Red Cross chapter and the Mount Carmel Rotary Club. He has served as chairman of the School Boy Patrol of the Mount Carmel Motor Club since it was formed.

Dr. Samuel attended Dickinson College and was graduated from the University of Pennsylvania School of Medicine; then, after a year as pathologist at the Pennsylvania Hospital in Philadelphia, he entered general practice in Mount Carmel. During World War I he served as captain in the Army Medical Corps assigned to the British Expeditionary Forces and was awarded the Purple Heart. He is a charter member and past-commander of the Mount Carmel American Legion post. A member of the Selective Service Board during World War II, he was active in civil defense, establishing first-aid stations throughout the area. He has been president of the Board of Health, Fraternity Club, Kiwanis Club, and president and founder of the Mount Carmel Chamber of Commerce.

Dr. Samuel has been president of his county and state medical societies and formerly was a member of the House of Delegates of the American Medical Association. He also has been president of the staff at the Shamokin State Hospital, compensation doctor for the Jeddo-Highland Coal Company, surgeon for the Lehigh Valley Railroad Company, member of the board of the Medical Service Association of Pennsylvania (Blue Shield), and a member of the American Academy of General Practice, the World Medical Association, and the Association of Railway Surgeons.

MEDICINE AND THE LAW

GROUP MEDICAL AND HOSPITAL SERVICE PLAN: NO VIOLATIONS FOUND

The Supreme Court of California in July, 1954, handed down its decision in *Complete Service Bureau* v. *San Diego County Medical Society*.[1] This case was concerned with the legality of certain aspects of the organization and operation of a "prepaid" group medical and hospital service plan, the Complete Service Bureau (CSB). The San Diego County Medical Society and some 30 of its member physicians had brought action against CSB seeking to enjoin it from certain allegedly unlawful practices in the carrying on of its business. It was alleged that (1) CSB had failed to comply with section 9201 of the California Corporations Code; (2) CSB was engaged in the corporate and lay practice of medicine; (3) the physicians connected with CSB were aiding and abetting the lay practice of medicine; (4) CSB and the physicians connected with it were splitting fees; (5) CSB engaged in intensive solicitation of patients; (6) much of CSB's advertising was misleading; (7) the practices of CSB and the physicians connected with it amounted to unfair competition with respect to the members of the San Diego County Medical Society; and (8) the commercialization of the practice of medicine which is harmful to the public health and welfare, was inherent in the activities of CSB. There was no allegation that the medical services furnished by CSB were in any way inadequate.

The facts as to CSB's formation and operations were not disputed. In 1939, one Parmer and two associates, none of whom was licensed to practice medicine, organized CSB under section 9200 of the California Corporations Code. Section 9200 provides: "A nonprofit corporation may be formed . . . for any lawful purposes which do not contemplate the distribution of gains, profits or dividends to the members thereof and for which individuals lawfully may associate themselves, such as . . . rendering services, subject to laws and regulations applicable to particular classes of nonprofit corporations or lines of activity. . . ." The articles of incorporation provided that CSB's main purposes were the establishment and maintenance of a fund obtained through periodic payments by its members, which fund was to be used to defray the cost of medical services and hospital care to members; to supply or procure at the lowest cost medical, hospital, and other services to the members on a periodic payment plan; and to furnish medical and hospital service to its members without profit to any agency.

Parmer was hired as manager of CSB under a 20 year contract. The rights under this contract were specifically made assignable and inheritable. Parmer was not required to devote all of his time to the job and could engage in any other occupation he chose. The contract provided that Parmer's compensation was to be 10% of the monthly dues paid by the members of CSB. Parmer's average annual income under this contract has been $8,320. Further, he was given under the contract an option to purchase at any time any or all of the real or personal property owned by CSB at its original cost, less depreciation. CSB leased a building in which medical services were to be furnished; under the lease CSB was given an option to purchase. A group of doctors were employed to perform the medical services at the leased building. The doctors were paid approximately 50% of the fees collected by CSB in accordance with a unit system.

At the time of the trial CSB had approximately 10,000 subscribers who paid $2.50 a month. This payment entitled a subscriber to up to 30 days' hospitalization for each sickness or injury, up to $10 toward ambulance service for each sickness or injury, and medical services in accordance with a schedule of fees listed. The subscribers' voting rights were restricted, and no subscriber had ever attended a meeting of CSB. Only once, immediately prior to the trial, had the subscribers been given effective notice of a meeting of CSB.

In 1940, CSB exercised its option and purchased the leased building at a price of $31,000. Parmer and the head doctor of CSB formed Group Property (GP), a stock corporation, in 1946. At that time Parmer exercised his option to purchase CSB's real property at the price of $31,000; the purchase price was paid in GP stock. Parmer then sold the building to GP for $102,500, payable in GP stock. Then Parmer, in his capacity as president of GP, leased the building to himself in his capacity as president of CSB on a month-to-month basis for a rent of 10% of the gross income of CSB. During the two and one-half years preceding the trial, GP received $108,000 from CSB in the form of rent. GP has paid no salaries and declared no dividends; it has spent approximately $100,000 in remodeling and refurnishing the building that it rents to CSB.

The trial court found for CSB on all issues. It took the position that section 9201 of the California Corporations Code provided an alternative, but not mandatory, method of organizing a nonprofit corporation for the purpose of rendering personal service and did not repeal or affect section 9200 of the California Corporations Code in any way. The trial court's conclusion that the specific activities of CSB that were complained of were not unlawful was apparently based on a finding that similar activities were engaged in by the California Physicians Service (CPS), an organization sponsored by the California Medical Association and its constituent county societies.

The district court of appeals for the fourth district reversed the judgment of the trial court.[2] The district court regarded section 9201 as a law applicable to CSB's particular line of activity with which under the terms of section 9200 CSB was required to comply, rather than as an alternative method of organizing a nonprofit corporation for the purpose of rendering personal service. The district court further said that CSB's advertising

1. 272 P. (2d) 497 (Calif., 1954).
2. 260 P. (2d) 1038 (Calif., 1953).

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was illegal and misleading and that there was splitting of fees in actuality if not in form.

The Supreme Court of California affirmed the judgment of the trial court on all issues. The medical society contended that a nonprofit medical service corporation could now be organized only under section 9201. Section 9201, which was enacted in 1941, provides that "A nonprofit corporation may be formed under this part for the purposes of defraying or assuming the cost of professional services of licentiates under any chapter of Division 2 of the Business and Professions Code or of rendering any such services, but it may not engage directly or indirectly in the performance of the corporate purposes or objects unless all of the following requirements are met: (1) at least one-fourth of all licentiates of the particular profession become members; (2) membership in the corporation and an opportunity to render professional services upon a uniform basis are available to all licensed members of the particular profession; (3) voting by proxy and cumulative voting are prohibited; (4) a certificate is issued to the corporation by the particular professional board whose licentiates have become members, finding compliance with the requirements of subdivisions (1), (2), and (3). Any such nonprofit corporation shall be subject to supervision by the professional board under which its members are licensed and shall also be subject to Section 9505." The Court held that a nonprofit medical service corporation could be formed under either section 9200 or section 9201. It was pointed out that section 9201 did not purport to repeal any part of section 9200 and that the language of section 9201 was permissive rather than mandatory. (In connection with this point, the Court cited *Group Health Association* v. *Moor*.[3] That case has no bearing on the point. The Moor case was concerned with the question of whether the formation of a corporation by a group of individuals, the purpose of which was to contract with groups of doctors for medical services, would constitute the practice of medicine. There was no question in the case of the proper interpretation of any statute providing for the incorporation of a nonprofit medical service corporation.) The Court rejected as dictum the statement in *Maloney* v. *American Independent Medical and Health Association* [4] that corporations such as CSB are also subject to the provisions of section 9201. The Court said that to regard all nonprofit medical service corporations as subject to section 9201 might lead to serious legal difficulties. There are a number of fraternal and beneficial organizations, formed under section 9200 prior to the enactment of section 9201, that have entered into contracts with subscribers and other persons to carry out their purpose of furnishing medical services. (In discussing this point the Court made no mention of *People ex rel. State Board of Medical Examiners* v. *Pacific Health Corporation, Inc.*,[5] wherein it is said, with respect to medical service plans run by fraternal and labor organizations, "But a most obvious and, to us, a fundamental distinction must be made between defendant and these other institutions. In nearly all of them, the medical service is rendered to a limited group as a result of cooperative association through membership in the fraternal or other association, or as a result of employment by some corporation which has an interest in the health of its employees. The public is not solicited to purchase the medical services of a panel of doctors; and the doctors are not employed or used to make profits for stockholders. In almost every case the institution is organized as a nonprofit corporation or association. Such activities are not comparable to those of private corporations operated for profit and, since the principal evils attendant upon corporate practice of medicine spring from the conflict between the professional standards and obligations of the doctors and the profit motive of the corporation employer, it may well be concluded that the objections of policy do not apply to nonprofit institutions.")

If the legislature had intended by enactment of section 9201 to eliminate these preexisting corporations, there would be a question of the impairment of contracts. The Court said that it was unlikely that the legislature was considering fraternal and other mutual nonprofit corporations when it enacted section 9201. In support of this conclusion the Court pointed out that it would be unreasonable to require such groups to include one-fourth of all licentiates as members or to require such limited groups to provide all licensed members of the profession an opportunity to render professional services. The Court further said that if section 9201 should be held to be the only section under which a nonprofit medical service corporation could be formed, there is the possibility that CPS, which is sponsored by the California Medical Association and all of its county medical societies, might exercise a monopoly in the field.

The medical society further contended that, even if a medical service corporation can be formed under section 9200, CSB was engaged in certain activities that were violative of chapter 5 of the California Business and Professions Code and that should therefore be enjoined. It was alleged that CSB was engaged in the corporate practice of medicine. Doctors presently employed by CSB and doctors who had been employed by it in the past testified that at no time had there been any interference with their practice of medicine. The Court regarded this testimony as substantial evidence to support the trial court's finding that only licensed physicians employed by CSB were engaged in the practice of medicine.

It was next alleged that CSB and members of its medical staff were engaged in splitting fees. This allegation was based on: (1) Parmer's contract as manager of CSB; (2) the rental lease between CSB and GP; (3) the fact that the doctors employed by CSB are compensated under the unit system; and (4) the fact that the doctors receive only 50% of the amounts collected by CSB. An expert witness testified that the salary range for a lay manager of a clinic such as that operated by CSB was $6,000-$15,000 per year. Parmer's average annual income, $8,320, was well within that range. In connection with the rental lease the Court pointed out

3. 24 F. Supp. 445 (Washington, D. C., 1938).
4. 259 (2d) 503 (Calif., 1953).
5. 82 P. (2d) 429 (Calif., 1938).

that GP had paid no salaries, had neither declared nor paid any dividends, and that it had spent $100,000 in remodeling and refurnishing the building. It was stated that the unit system was a customary method of payment to members of medical groups. The other 50% of the amounts collected by CSB is used to pay overhead expenses. There was testimony that 50% was a "standard" figure for overhead expenses for medical practice in general and also for group practice. The Court said that these factors constituted substantial evidence to support the trial court's conclusion that there had been no splitting of fees. Judge Edmonds, in a dissenting opinion, questioned the soundness of the majority's conclusion with respect to some of these factors. He stated that, in view of the vague nature of Parmer's duties under his management contract, there is considerable doubt that the amounts paid to him can be regarded as compensation for services actually rendered. He further pointed out that it was immaterial that GP had paid no dividends, because its net worth had increased and Parmer, as controlling stockholder, could declare a dividend at any time he wished. Judge Edmonds concluded by saying, "In any event, it is a novel proposition of law that one who receives funds from an improper source, or gains them in an improper manner, may be excused from legal consequences if he does not take too much."

The Court found that there was substantial evidence to support the trial court's conclusion that none of CSB's advertising was, as the medical society had alleged it to be, false or misleading. The medical society had complained of those advertisements of CSB in which it had referred to its plan as a prepaid medical plan and to its advertisements that said, "Surprise! A 24-Hour Medical-Surgical Hospital Service for Only $2.50 a Month" and "You will be surprised how much medical, surgical and hospital care you can buy for $2.50 a month." The Court said that these advertisements were not misleading because all of CSB's members were advised of the medical fee schedule that was part of their contract and that none of them thought they were going to receive complete medical, surgical, and hospital care by prepaying $2.50 a month. The medical society had also complained of an advertisement, which read, "Your money goes for Medical Care and other Hospital Services exclusively," on the ground that it was false and misleading, since Parmer received a part of the money for his services as manager. The Court said that this would probably have made no difference to the subscribers. In connection with the question of whether the advertisements of CSB were false and misleading, advertisements of CPS were introduced in evidence to show the similarity between the two. The Court took the position that, although common practice is generally reasonable and lawful practice, it is not always so. It regarded the type of advertising used by CPS as merely one factor to be used in determining the legality of CSB's advertising, rather than assigning a conclusive weight to this factor as was apparently done by the trial court.

It was also held by the Court that CSB's advertising did not, as had been alleged by the medical society, violate section 2380.5 of the Business and Professions Code, which provides that "All advertising of the medical business in connection with which the holder of any certificate fails to use his name constitutes unprofessional conduct within the meaning of this section." It was said that this section was not applicable to nonprofit medical groups because they do not hold medical licenses and are not advertising in behalf of any particular doctors. To support this conclusion that the advertising was not in behalf of any particular group of doctors, the Court pointed out that the relation between the physicians and CSB could be terminated on 60 days' notice.

The medical society had alleged that CSB's solicitation of members through hired solicitors violated section 2399 of the Business and Professions Code, which forbids the employment of "cappers" or "steerers" in the procuring of practice for a medical practitioner. The Court said that medical service groups, including CPS, commonly solicit members and that these activities were not intended to be within the scope of the statute. The fact that CSB's staff of doctors is not constant indicates that the members are being solicited for the group rather than for any particular practitioner.

The Court said that there was no evidence in the record to support the medical society's allegation that the activities of CSB constituted unfair competition.

It was said in conclusion that there was sufficient evidence in the record to support the trial court's general conclusion that none of the activities or policies of CSB was harmful or inimical to the public health and welfare and that none of them would lower the standards of the medical profession.

It is difficult to say just what is the significance, with respect to the law relating to corporate practice of medicine, group medical and hospital service plans, and splitting of fees, of the decision in the *Complete Service Bureau* case. The decision can be regarded as nothing more than a statement that there was sufficient evidence to support the trial court's conclusion that no part of CSB's organization or operations was in violation of the existing law; the decision, therefore, made no new law. However, the Supreme Court, in its opinion, cited only a few previous cases, none of which seem particularly applicable to the matter that was before it. The Court did cite *Pacific Employers Insurance Company* v. *Carpenter* [6] in support of the proposition that the professions are not open to commercial exploitation and that it is against public policy to permit a middleman to intervene for profit in establishing the professional relationships between the members of a profession and the members of the public; but, the Court went on to say that ". . . this principle is not contravened by permitting a group of interested persons to form a nonprofit corporation to secure for themselves medical services at a low cost." It might be that the Supreme Court of California regarded any evils of the commercialization of the medical profession that might arise from CSB's methods of operations as being outweighed by the good that it felt resulted from CSB's furnishing of admittedly adequate medical services at a low cost to a large group of persons who might not otherwise be able to obtain such services.

6. 52 P (2d) 992 (Calif., 1935).

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MEDICAL NEWS

CALIFORNIA

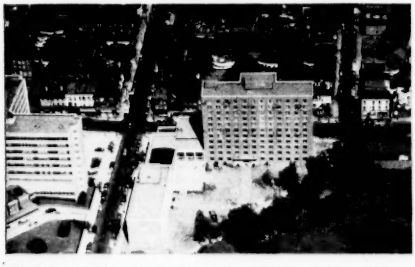
Student Loan Fund.—The Loma Linda Foundation fund of the College of Medical Evangelists recently received $100,000 from a patient at Glendale Sanitarium and Hospital, whose father was a physician. The gift, made in the form of an annuity in appreciation and recognition of the medical care received from hospital personnel, will eventually become available for student loans, which now total about $500,000, including loan funds handled in trust.

Emotional Problems in Office Practice.—The University of California Extension offers a class in treatment of those with emotional problems in office practice on Thursdays, 8-10 p. m., Jan. 5-March 22, 1956, in room 108, Old Religious Conference Building on the Los Angeles campus, with Dr. Frank F. Tallman, professor of psychiatry, as instructor. Enrollment is limited to 25 persons. Application and fee ($50) should be mailed promptly to Dr. Thomas H. Sternberg, Assistant Dean for Postgraduate Medical Education, University of California Medical Center, Los Angeles 24.

Physicians' Art Show.—Coincident with the midwinter medical meeting of the Los Angeles County Medical Association, the Los Angeles Physicians' Art Society will stage its annual exhibition from Dec. 20, 1955, to Jan. 20, 1956, at L. A. C. M. A. headquarters, 1925 Wilshire Blvd. Physician-artists (duly paid members) should send their most recent works (limit three) to the L. A. C. M. A. Auditorium, to arrive not later than 5 p. m., Dec. 16. There will be a hanging charge of $2 each for two pieces submitted; three pieces, $5. Names and media of pieces submitted must be in the hands of Miss Virginia Brown, executive secretary of the society, 1234 N. Vermont Ave., Los Angeles 29, by Dec. 12. A cocktail party and dinner ($3.50) at 6:30 p. m., Dec. 20, will open the exhibition.

CONNECTICUT

Harkness Residential Hall at Yale.—The Edward S. Harkness Memorial Hall, a residential center for medical students, was dedicated Oct. 7 at Yale University in New Haven. Dr. Vernon



The L-shaped Edward S. Harkness residential hall occupies a triangular block. The Grace-New Haven Community Hospital is located at the left, across the street.

W. Lippard, dean, Yale University School of Medicine, was presiding officer for the program. The structure, which covers a block in the heart of the Yale-New Haven Medical Center, is named after the late Edward S. Harkness, whose gifts to Yale for new buildings are said to have changed the face of the campus in the 1920's and 1930's. The red-brick building has two wings—one 11 stories high and the other 4 stories, connected by a 2-story structure housing a lounge and a dining hall. The dormitory space includes accommodations for 266 medical students, both men and women; special apartments for married students; a special apartment for the resident faculty member, Dr. Donald P. Shedd, assistant professor of surgery; and a guest suite for visiting lecturers and scientists. Residential facilities include dining rooms, gymnasium, a game and music room, and snack bar.

Yale Appointments in Anesthesiology.—Dr. Nicholas M. Greene, previously associate professor of anesthesia at the University of Rochester School of Medicine and Dentistry and anesthetist-in-chief of Strong Memorial Hospital in Rochester, N. Y., joined the faculty of Yale University School of Medicine, New Haven, July 1, as professor of anesthesiology and lecturer in pharmacology. Dr. Greene will be director of anesthesiology in the Grace-New Haven Community Hospital. He will develop an expanded teaching and investigative program in anesthesiology at Yale, assisted by Dr. Alastair J. Gillies, formerly of Rochester, N. Y., who has been appointed assistant professor of anesthesiology and associate director of anesthesia at the Grace-New Haven Community Hospital. Dr. Gillies' father is professor of anesthesia at Edinburgh University, Scotland.

ILLINOIS

Personal.—Dr. Richard J. Graff, superintendent of Manteno State Hospital, recently received a citizen's award commemorating his 25 years as a physician dedicated to care of the mentally ill. A silver plaque was presented to him during the third annual volunteer award ceremonies at Manteno.

Symposium on Arteriosclerosis.—In cooperation with the Chicago Heart Association, the Aux Plaines branch of the Chicago Medical Society will present a symposium on arteriosclerosis Dec. 16 at the Oak Park Club (Euclid 6-8200), 721 Ontario, Oak Park. Dinner, 7 p. m., will be preceded by a fellowship hour. "Pathogenesis—Epidemiological Evidence" will be considered by Dr. Jeremiah Stamler, Chicago, and "Pathogenesis—Experimental Evidence" by Dr. Ruth Pick, respectively assistant director and research associate, cardiovascular department, Medical Research Institute, Michael Reese Hospital, Chicago. Clinical aspects will be discussed by Dr. Norman B. Roberg, associate professor of medicine, University of Illinois College of Medicine, Chicago. Audience participation will follow. All physicians are welcome.

Chicago

Society News.—The Society of Medical History of Chicago will hold an open meeting at the Institute of Medicine (fourth floor, 86 E. Randolph St.) Dec. 14, 8 p. m. Dr. Lester S. King will present "Similia Similibus" and Dr. Israel Davidsohn, "Medical Caricatures—A Mirror of Medical History." All are welcome.

CIO Health Center.—The Sidney Hillman Health Center, the nation's fourth health center to provide medical care for CIO unionists in the clothing industry was recently dedicated by the CIO Amalgamated Clothing Workers of America. It occupies two floors of the Amalgamated center at 333 S. Ashland Ave. Its staff, headed by Dr. William S. Hoffman, professorial lecturer in medicine at the University of Illinois College of Medicine, will include 30 specialists and a staff of technicians.

The Physician in Dental Diagnosis.—As part of its postgraduate course in diagnosis, roentgenography, and treatment planning, the Northwestern University Dental School will present a lecture, "The Role of the Physician in Diagnosis in Dentistry," by Joseph C. Calandra, Ph.D., professor of pathology, Dec. 14, 9 a. m. "Clinical and Roentgenographic Correlation Between Oral and Systemic Diseases" will be considered by Arthur Elfenbaum, D.D.S., chairman of the department of diagnosis.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

WTTW to Rerun "March of Medicine."—In conjunction with the beginning of its full-time operation, station WTTW will rerun on channel 11 the series of medical documentaries, the March of Medicine, originally produced by Smith, Kline & French Laboratories in cooperation with the American Medical Association. The 10 week series, sponsored by the Chicago Medical Society, will be presented each Wednesday night at 9 p. m., as a public service feature. The first telecast, Dec. 14, will be "We, the Mentally Ill," narrated and enacted by mental patients.

IOWA

Health Forums.—The Scott County Medical Society in conjunction with the Davenport Newspapers, Inc., held a public forum on poliomyelitis Nov. 3 and one on "The Wonder Drugs" Nov. 10 in Davenport. This is the third year that the free public forums have been held.

University News.—Dr. Robert C. Hickey, associate professor of surgery, State University of Iowa College of Medicine, Iowa City, has been named assistant dean for research. He will be responsible for the coordination and administration of more than 200 teaching and research grants and research fellowships. His duties as assistant dean will be in addition to his teaching.——Dr. Iain Maclean Smith, formerly affiliated with the department of pathology and microbiology, Rockefeller Institute for Medical Research, New York, has been appointed assistant professor of internal medicine at the University Hospitals, State University of Iowa, Iowa City. Dr. Smith, a graduate of the University of Glasgow, Scotland, has served at Barnes Hospital, St. Louis, Johns Hopkins Hospital, Baltimore, and Sheffield University, Sheffield, England. Members of the department who have recently been promoted include Dr. James W. Culbertson, from associate professor to professor, and Dr. Bernard I. Lewis, from assistant professor to associate professor.

KENTUCKY

Rural Health Conference.—The 1956 Kentucky State Rural Health Conference will be held at the Kentucky Hotel, Louisville, Jan. 19, 1956, under the sponsorship of the Kentucky Rural Health Council and the Kentucky State Medical Association.

Students Honor Dr. Ackerly.—A group of psychiatry students has honored Dr. S. Spafford Ackerly, Louisville, by establishing the "Ackerly Society of Psychiatric Residents of the University of Louisville School of Medicine." The society gave a dinner on July 12 for Dr. Ackerly, who is chairman of the department of psychiatry at the medical school.

MARYLAND

Appoint Professor of Urology.—The University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, announces the appointment of Dr. John D. Young Jr. as professor of urological surgery to fill the vacancy created by the retirement of Dr. W. Houston Toulson. Dr. Young obtained his medical degree from the University of Maryland in 1941. During World War II he served in the U. S. Army, from which he was discharged with the rank of captain in the medical corps. He has been on the staffs of University Hospital and the Johns Hopkins Hospital, Baltimore.

Award to Dr. Pincoffs.—Dr. Maurice C. Pincoffs, head, department of preventive medicine, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, has received the Alfred Stengel Memorial award from the American College of Physicians. To attain this honor, the candidate "must have displayed an outstanding influence in maintaining and advancing the best standards of medical practice and clinical research in perpetuating the history and traditions of medicine and medical ethics in upholding the dignity and efficiency of internal medicine in its relation to public welfare." Dr. Pincoffs, currently editor of the *Annals of Internal Medicine*, is a past-president of the American College of Physicians.

MICHIGAN

Program on Chronic Disease.—As part of a two day in-service training program on chronic disease for the staff of the Michigan Department of Health and local full-time health officers, the division of tuberculosis and adult health, Michigan Department of Health, will sponsor a dinner meeting at the Hotel Porter, Lansing, Dec. 19, 6:30 p. m. The speaker will be Dr. Cecil G. Sheps, executive director, Beth Israel Hospital, Boston.

NEBRASKA

Director of Psychiatric Research.—Dr. Jackson A. Smith, formerly assistant professor of psychiatry at Harvard Medical School, Boston, and Baylor University College of Medicine, Houston, Texas, has joined the staff of the Nebraska Psychiatric Institute as director of research and will also serve as professor of neurology and psychiatry at the University of Nebraska College of Medicine, Omaha. Dr. Smith will develop and direct a statewide psychiatric research program for which the state legislature has appropriated funds. Research now under way includes the study of geriatric problems and problems of emotionally disturbed children.

NEW YORK

Einstein College Professorial Appointments.—The Albert Einstein College of Medicine of Yeshiva University has announced appointment of the following physicians as professor and chairman of their respective departments: Ernst A. Scharrer (anatomy), Irving London (medicine), Alfred Angrist (pathology), Henry L. Barnett (pediatrics), Henry D. Lauson (physiology), Marcus D. Kogel, dean (preventive and environmental medicine), Milton Rosenbaum (psychiatry), Milton Elkin (radiology), and Leo M. Davidoff (surgery). Drs. John Frosch and Charles B. Ripstein have been appointed professor and executive officer of the departments of psychiatry and surgery, respectively, and Dr. Henry B. Makover, professor of preventive and environmental medicine.

Personal.—Dr. Samuel K. Levy, Brooklyn, has been appointed chief attending pediatrician at the Bushwick Hospital, Brooklyn. He is associate attending pediatrician at the Maimonides Hospital.——Dr. Leo M. Taran has resigned as medical and research director at St. Francis Sanatorium for Cardiac Children, Roslyn, with which he has been affiliated since its founding in February, 1938. Dr. Taran's offices are now located at the Garden City Medical Center, 520 Franklin Ave., Garden City.——Dr. Robert C. Hunt, assistant commissioner for community mental health services, New York State Department of Mental Hygiene, recently conducted a six weeks' study of community mental health activities in Holland and England under a fellowship from the United Nations World Health Organization.

Mental Clinic.—The third of four centralized clinics designed to provide after-care for mental patients in the New York City area has been opened at 150 Hillside Ave., Jamaica, Long Island. The other new clinics are at 105 Schermerhorn St., Brooklyn, and 1910 Arthur Ave., Bronx. An existing clinic in Manhattan is to be expanded and converted to the new system at a later date. Dr. Eugene B. F. Riley, formerly supervising psychiatrist at Creedmoor State Hospital, Queens Village, is psychiatrist in charge at the Queens clinic. The services are available presently only to patients released from Creedmoor State Hospital since Sept. 1, 1955. The program will be expanded as professional workers are available and will later provide treatment services for all persons residing in Queens County who have had psychiatric treatment in the department's institutions. The new after-care clinics replace those formerly conducted by individual state institutions.

Society News.—At the last meeting of the Kings County Radiological Society, Dr. Louis Goldfarb was elected president; Dr. Hyman I. Teperson, vice-president; Dr. Solomon Maranov, secretary; and Dr. Ernest I. Melton, treasurer, all from Brooklyn.——At its meeting Dec. 20 in MacNaughton Auditorium, the Medical Society of the County of Kings will present "The Management of Advanced and Recurrent Carcinoma" by Dr. J. Englebert Dunphy, professor of surgery, Harvard Medical

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School, Boston.——The Brooklyn Urological Society will have as speaker (Dec. 13, 9 p. m., in the Kings County Medical Society Building, 1313 Bedford Ave.) Dr. Wyland F. Leadbetter, chief of urology, Massachusetts General Hospital, Boston, whose topic will be "Cystectomy and Urinary Diversion."——Newly elected officers of the Nassau Radiological Society (19 Clinton Rd., Garden City) include: Dr. Herbert R. Zatzkin, Hempstead, president; Dr. Arthur I. Frucht, Hempstead, vice-president; Dr. Frances M. Behrendt, Garden City, secretary; and Dr. John Knapp, Freeport, treasurer.

New York City

Harvey Lecture.—Dr. Karl Meyer, professor of biochemistry, Columbia University College of Physicians and Surgeons, will deliver the fourth Harvey Lecture of the 1955-1956 series at the New York Academy of Medicine Dec. 15 on "The Chemistry of the Mesodermal Ground Substances."

Dr. Bugher Receives Award.—Dr. John C. Bugher, who retired Sept. 30 as director of the division of biology and medicine of the U. S. Atomic Energy Commission, was presented the Atomic Energy Commission Distinguished Service award and the Superior Accomplishment award, the latter carrying a cash award of $2,000. Dr. Bugher has returned to the Rockefeller Foundation, where he is now director of medical education and public health.

Courses on Cardiology.—Dr. Arthur M. Master will conduct a course in elementary electrocardiography, PM 41, Jan. 16-21, 1956, and a course in advanced electrocardiography, PM 42, Jan. 23-28, at Mt. Sinai Hospital. Morning sessions will be held Monday through Saturday from 10 a. m. to 1 p. m.; Monday, Wednesday, and Friday afternoon classes will meet from 2 to 4 p. m.; Tuesday and Thursday afternoon classes from 2 to 5 p. m. Dr. Master will conduct a course on cardiovascular diseases, PM 31, Jan. 30 to Feb. 10, Monday through Friday, 9 a. m. to 12 noon and 1 to 5 p. m.

Health Department Needs Part-Time Pediatricians.—The children's services in the department of health have a few vacancies for part-time physicians with training in pediatrics. Arrangements are generally made for service for five morning sessions a week. Physicians are paid on a per session basis. Before employment, a short orientation and training course is given. Interested physicians are requested to call the health department at WOrth 2-6900 (for work in child health stations, ask for the Bureau of Child Health, Extension 461; for work with school age children, Bureau of School Health, Extension 320; and for work with the Bureau for Handicapped Children, Extension 229).

Dr. McCormack Accepts Hospital Post.—Dr. James E. McCormack, associate dean for graduate studies, Columbia-Presbyterian Medical Center, has been appointed an assistant vice-president of the Presbyterian Hospital, where he will be responsible for public interest and for professional services. A consultant to the Assistant Secretary of Defense and a member of the Civilian Health and Medical Advisory Council, Dr. McCormack was previously associated with the Office of Scientific Research and Development and with the Research and Development Board of the Department of Defense and since 1950 has been executive director of the New York City Medical Advisory Committee to the Selective Service system. He is also chairman of the New York committee on the study of hospital internships and residencies.

Grants in Accident Prevention.—Two two-year grants of $200,000 each have been allocated by the Chrysler Corporation and the Ford Motor Company for the expansion of the Automotive Crash Injury Research program in the department of public health and preventive medicine, Cornell University Medical College. The money will be used to further research in the interest of the traveling public and the automobile industry. The program on causes of injury in automobile accidents has been supported by the Commission on Accidental Trauma of the Armed Forces Epidemiological Board of the U. S. Department of Defense and the U. S. Public Health Service. The major purposes of this research are: (1) to obtain scientifically meaningful information on what happens to the occupants of vehicles at the time of an actual crash on the highway and (2) to see whether there are any definite correlations between particular patterns of injury and vehicular design. An interstate cooperative research program has been established with state medical societies, departments of public health, police and traffic enforcement agencies in North Carolina, Virginia, Maryland, Connecticut, Indiana, Minnesota, Arizona, Vermont, and the city of Minneapolis. Texas was scheduled to join the group in October.

OHIO

Society News.—On Dec. 14 at 8 p. m. the Cincinnati Society of Neurology and Psychiatry will present Dr. Edgar A. Bering Jr., director, Neurosurgical Research Laboratory, Children's Medical Center, Boston, who will consider the physiology of the cerebral spinal fluid.

Personal.—At Camp Ho Mita Koda in Geauga County, Dr. Henry J. John, Cleveland, was presented with a plaque honoring his 25 years as founder and president of the camp. Groups of 60 diabetic children at a time attend the camp in each of two month-long sessions.——Dr. Howard P. Taylor has been appointed to take charge of the new obstetrical department of the Cleveland Clinic, which will include on its staff Drs. Albert C. Lammert and James S. Krieger, of Cleveland.——Dr. Albert B. Sabin, professor of research pediatrics, University of Cincinnati College of Medicine, was recently invited to lecture at the universities of Lisbon and Oporto in Portugal. He planned to lecture also in France, Sweden, England, and Ireland.

TEXAS

Pediatric Consultant Needed.—The merit system council for the Texas State Department of Health announces an examination for a senior pediatric consultant (salary range, $660-$810); minimum qualifications: (1) M.D. degree, (2) one year's internship in an approved hospital, (3) three years' experience in pediatrics including at least one year's residency in pediatrics, and (4) licensure to practice medicine in Texas. For application write: Merit System Council, 814 Littlefield Bldg., Austin.

Cancer Fund.—Mrs. Mildred Didrikson Zaharias, recently hospitalized for the treatment of cancer, has established the Babe Didrikson Zaharias fund, with offices at University Station, Galveston. The purpose of the fund is not to support research but to make available basic materials and technical personnel necessary for the efficient operation of tumor clinics and for the purchase of equipment necessary in the treatment of malignant diseases. Dr. Hyman W. Paley, Galveston, executive secretary of the fund, announces that, although it will be several months before the fund is in a position to process them, applications will be received at the office of the fund in Galveston.

VIRGINIA

Oto-Ophthalmologists on Cruise.—The Virginia Society of Ophthalmology and Otolaryngology is sponsoring a convention cruise to Havana and Nassau on May 26 to June 2, 1956. Sailing from and returning to Norfolk, the "Queen of Bermuda" will serve as the hotel for the trip. Fare for seven days will be $165 and up per person. Reservations may be made with the United States Travel Agency, Inc., Washington, D. C. Dr. Carl C. Cooley, Medical Arts Building, Norfolk, is publicity chairman for the cruise.

WASHINGTON

Fellowships in Pediatric Cardiology.—One or two fellowships in pediatric cardiology will be available beginning July, 1956, at the Children's Orthopedic Hospital, Seattle. Training will be in conjunction with the department of pediatric cardiology, University of Washington School of Medicine, Seattle. The salary is open. Applicants should have a minimum of two years in pediatrics. Direct correspondence to Dr. Robert A. Tidwell, the Children's Orthopedic Hospital, 4800 Sand Point Way, Seattle 5.

WEST VIRGINIA

Society News.—Newly elected officers of the West Virginia Tuberculosis and Health Association include: Dr. Harold H. Howell, Madison, president (reelected); Mr. Oscar Andre, Clarksburg, vice-president; and Mrs. W. H. Levell, Oak Hill, secretary.——Dr. James P. McMullen, Wellsburg, president, West Virginia State Medical Association, has appointed a committee to confer with a similar committee from the West Virginia Hospital Association in preparing for the medical licensing board a "statement of principles and procedures to comply with the law in the best interests of the public concerning the legality of certain policies employed by hospitals in the collection of medical and hospital fees." The members of the committee from the medical association are Drs. Thomas G. Reed, Charleston; Charles E. Watkins, Oak Hill; and Delivan A. MacGregor, Wheeling.

New Health Center in Huntington.—Dr. Leonard A. Scheele, Washington, D. C., surgeon general of the U. S. Public Health Service, will be the speaker at 8 p. m., Dec. 14, at dedicatory ceremonies for the new health center in Huntington. His address will be delivered at the Huntington Central High School. Open house at the health center, 2-5 p. m., will precede the dedicatory exercises. Building of the new health center at 1336 16th St. was begun in September, 1954. Construction costs totaled more than $250,000. Matching funds for use with a Hill-Burton allocation were provided by the Cabell County court, the city of Huntington, the Junior League, and the Huntington Heart Association. The large one-story building will house the combined health department, formerly quartered in both the Court House and the City Building, the Cancer Information Center, the Huntington Heart Association, the Children's Clinic, and the Baby Clinic.

Personal.—Dr. Ralph H. Zemer, clinical director of the Huntington State Hospital, has been named superintendent of the West Virginia Training School at St. Marys to succeed Dr. Russell L. Heinlein, who resigned to enter private psychiatric practice in Parkersburg.——The following doctors were recently elected to honorary life membership in the West Virginia State Medical Association: Guy H. Michael, Parsons; Harry S. Keister, Fairmont; William A. Adams, Parkersburg; Stephen W. Bull, Spencer; Ludwig Frank, London, England; and Ray Kessel, Ripley.——Dr. and Mrs. Karl J. Myers Jr., Philippi, have enlisted for a three year period as missionaries to Nigeria, West Africa. Mrs. Myers is the former Mary Elizabeth Lawton, graduate of the Woman's Medical College of Pennsylvania, Philadelphia. Dr. Myers and his family will attend language school at Oyo, before reporting for duty at the 70-bed Baptist Hospital at Ogbomosho.——At a technical lecture sponsored by Charleston General Hospital, Dr. Arthur A. Shawkey, first Charleston physician to practice pediatrics, received from members of the Kanawha Medical Society an engraved plaque in recognition of his 55th year as a practitioner in that city. Dr. Shawkey has served as president of the Kanawha Medical Society and has held office in the West Virginia State Medical Association. The speaker was Dr. Harry C. Shirkey of Cincinnati, who presented "Childhood Diseases."——Dr. Robert W. Love, Moorefield, who has served Hardy County for 52 years, recently announced his retirement from practice. Dr. Love spent two years with the Gran Chaco Indians of Paraguay, South America, as a medical missionary, before coming to Moorefield. He has been an elder in the Presbyterian church for 53 years, a member of the school board, and has served as head of the Red Cross, president of the chamber of commerce, a member of the draft board during World War I, and an examiner during World War II. He is a past-president of the Potomac Valley Medical Association and has been a member of the house of delegates of the West Virginia State Medical Association.

WISCONSIN

Survey of Epilepsy.—A statewide survey of the epilepsy problem was initiated this fall by the rehabilitation division of the state board of vocational and adult education. Made possible by funds from the Wisconsin Epilepsy League and the Department of Health, Education, and Welfare, the study will verify the number of epileptics in Wisconsin, now estimated at 14,000. A study of employer acceptance of the epileptic will be made to ascertain attitudes and beliefs that limit job opportunities.

University News.—Marquette University School of Medicine, Milwaukee, has reorganized its cardiopulmonary laboratory at the Milwaukee County Emergency Hospital. The laboratory specializes in the cardiac catheterization technique and in the study of pulmonary function. Dr. John H. Huston is physician in charge, and physicians from the departments of pediatrics and surgery have been added to the group of heart specialists at the laboratory. The laboratory serves as a diagnostic and research center for the cardiovascular division and offers educational opportunities for young physicians, medical students, and nurses.

GENERAL

Casselberry Prize.—The American Laryngological Society announces that, a sufficient sum having accrued from the Casselberry fund (for encouraging advancement in the art and science of laryngology and rhinology), this sum is now available, in part or as a whole, for a prize award. Theses must be in the hands of the secretary, Dr. Harry P. Schenck, 326 S. 19th St., Philadelphia, before March 1, 1956.

Cerebral Palsy Foundation.—To accelerate the research attack on cerebral palsy, the United Cerebral Palsy Research and Educational Foundation was recently established by United Cerebral Palsy and a group of industrialists. The foundation will seek gifts from industry, corporations, and foundations to be added to funds set aside for research and training by United Cerebral Palsy and its nationwide network of affiliates, each of which allocates a percentage of contributions for the national program.

Geriatrics Awards.—The Ciba Foundation for the Promotion of International Cooperation in Medical and Chemical Research, 41 Portland Pl., London, W. 1, invites papers on experimental research into basic problems of aging. Five awards, of an average value of £300 each (about $840), are available for the period 1955-1956. Entries must be received by G. E. W. Wolstenholme, director, not later than Feb. 10, 1956. The work submitted should not have been published before July 31, 1955. Papers should not be more than 7,000 words in length, and a summary in English not exceeding in words 3% of the length of the paper must be attached.

Literature on Psoriasis Requested.—The Biological Sciences Foundation, a nonprofit association at the Hillyard House, 1011 New Hampshire Ave., N. W., Washington 7, D. C., which is compiling a comprehensive bibliography on psoriasis (available during the latter part of this year, without charge to members of the medical profession), is interested in receiving communications regarding unpublished papers and also reprints of papers for its files. The foundation's recent conference on psoriasis at the New York Academy was attended by faculty members from the University of Michigan Medical School, Ann Arbor, Harvard Medical School, Boston, Columbia University College of Physicians and Surgeons, New York, and some 20 other scientists who had done work on psoriasis.

Publications on Rheumatic Fever.—The Helen Hay Whitney Foundation, 525 E. 68th St., New York 21, has announced the compilation of the following publications in the field of rheumatic fever and rheumatic heart disease: (1) a directory of facilities for care of patients with rheumatic fever and rheumatic disease (first issued by the foundation in December, 1954, the directory went into a second edition in April, 1955); (2) bibliographies on various aspects of rheumatic fever, for the use of professional workers in the field; and (3) a list of publications on rheumatic fever for lay persons, compiled in response to requests from physicians for such material and intended to save the physician's time in selecting suitable literature for education of the patient's family.

Nominations Invited for Hunter Award.—The American Therapeutic Society, which annually presents the Oscar B. Hunter Memorial award in honor of its late secretary, Dr. Oscar B.

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Hunter of Washington, D. C., invites nominations for the 1956 award. The award, made in recognition of an outstanding contribution or series of contributions to therapy by an individual or a team of workers, seeks to bring recognition to those who have not received distinguished awards for their work. The term "therapy" is used in a broad sense, to include the use of any drugs, procedure, or device of benefit in the treatment of patients. The award was this year presented to Dr. Jonas E. Salk, who spoke at the 56th annual meeting of the American Therapeutic Society at Atlantic City, N. J., June 4. The deadline for receiving nominations for the 1956 award is Feb. 1, 1956. Nominations may be sent to Dr. Harry E. Ungerleider, Chairman, Oscar B. Hunter Memorial Award Committee, 393 Seventh Ave., New York 1.

Indian Health Service.—According to the U. S. Department of Health, Education, and Welfare, 30 Indian youths from 12 states have entered training at Phoenix, Ariz., to aid in sanitation work among their people. The course is part of a program to improve health conditions among the American Indians and Alaskan natives. After six weeks of intensive training in sanitation and hygiene, the Indians will be assigned to assist Public Health Service sanitary engineers on Indian reservations in Arizona, Colorado, Idaho, Minnesota, Montana, New Mexico, North Carolina, North Dakota, Oregon, South Dakota, Wisconsin, and Washington. The training program, operated with the cooperation of the Arizona State Health Department, is financed through funds appropriated to HEW for public health and medical services for the Indians. Dr. James R. Shaw, head of the Indian health program in the Public Health Service, states, "The Indian people have 8 times more typhoid, 25 times more infectious hepatitis, and 22 times more dysentery than prevails among the general population. These conditions are due in large measure to the fact that many Indians have only polluted water to drink and are without adequate sanitary and sewage disposal facilities." A similar course for native sanitarian aides in Alaskan villages was scheduled to start at Nome Oct. 17.

Society News.—Dr. Emma S. Moss, New Orleans, was recently installed as president of the **American Society of Clinical Pathologists**; Dr. John L. Goforth, Dallas, Texas, was made president-elect. The 1956 convention will be held in Chicago. ——At the annual meeting of the **American Association of Obstetricians and Gynecologists** the following officers were elected: Dr. Lawrence M. Randall, Rochester, Minn., president; Dr. F. Bayard Carter, Durham, N. C., president-elect; Dr. Raymond A. Gillis, Pittsburgh, vice-president; Dr. Ward F. Seeley, Detroit, treasurer; Dr. Frank R. Lock, Winston-Salem, N. C., secretary; and Dr. F. Stewart Taylor, Denver, assistant secretary. The 1956 annual meeting will be held at the Homestead, Hot Springs, Va., Sept. 6-8.——Newly elected officers of the **Rocky Mountain Radiological Society** include: Dr. Maurice D. Frazer, Lincoln, president; Dr. John S. Bouslog, Denver, president-elect; Dr. Capres S. Hatchett Jr., Amarillo, Texas, first vice-president; Dr. Ralph C. Moore, Omaha, second vice-president; and Dr. John H. Freed, Denver, secretary-treasurer. The next meeting of the society will be held at the Shirley-Savoy Hotel, Denver, Aug. 16-18, 1956.——Newly elected officers of the **Association of Life Insurance Medical Directors** include: Dr. Ralph R. Simmons, Des Moines, Iowa, president; Dr. Edson E. Getman, New York, president-elect; Dr. Norman J. Barker, Hartford, Conn., vice-president; Dr. Henry B. Kirkland, Newark, N. J., secretary; and Dr. J. Grant Irving, Hartford, Conn., treasurer.——The **American Academy of Ophthalmology and Otolaryngology** recently chose Dr. Erling W. Hansen, Minneapolis, president-elect; Drs. M. Hayward Post, St. Louis, Henry L. Williams, Rochester, Minn., and Walter E. Atkinson, Watertown, N. Y., vice-presidents; and Dr. William L. Benedict, Rochester, Minn., executive secretary (reelected). Dr. Albert C. Furstenberg, Ann Arbor, Mich., is president.

LATIN AMERICA

Ophthalmologic Congress in Chile.—The fifth Pan American Congress of Ophthalmology will be held in Santiago, Chile, Jan. 9-14, 1956, under the auspices of the Pan American Association of Ophthalmology, of which Dr. Moacyr E. Alvaro, São Paulo, Brazil, is president. Dr. Cristobal Espildora Luque of Santiago will be president of the congress. Symposiums will be offered on collagen diseases, glaucoma, infantile glaucoma, secondary glaucoma, detachment of the retina, psychosomatic ophthalmology, tropical diseases, physiopathology and surgery of the crystalline lens, plastic surgery, visual fields and neuro-ophthalmology, and intraocular tumors. Symposium participants from the United States will include: Drs. John M. McLean, Frank H. Constantine, and Algernon B. Reese, New York; A. Edward Maumenee, San Francisco; Lorenz E. Zimmerman, Washington, D. C.; Irving H. Leopold and P. Robb McDonald, Philadelphia; William L. Benedict, Rochester, Minn.; Peter C. Kronfeld, Derrick T. Vail, and David Shoch, Chicago; Elmer J. Ballintine and Lorand V. Johnson, Cleveland; H. Saul Sugar, Detroit; Charles L. Schepens and L. Harrell Pierce, Boston; Harold F. Falls, Ann Arbor, Mich.; Robison D. Harley, Atlantic City, N. J.; and Theodore F. Schlaegel Jr., Indianapolis.

FOREIGN

International Meeting on Librarianship.—At its meeting in Brussels, Belgium, Sept. 10, the International Congress of Libraries and Documentation Centres confirmed the wish, expressed at the first international congress of medical librarians (London, 1953), that an international association of medical libraries and documentation centers be created as soon as possible. To this end, the congress requests that the national associations of librarians and documentalists create medical sections and establish close cooperation with the medical profession for the development and coordination of their common interests.

Electron Microscopes for Neurological Research.—Three RCA electron microscopes were recently purchased by the new Institute for Neurology and Brain Research, Caracas, Venezuela, of which Dr. H. Fernandez-Moran is director. The microscopes will be used in research studies. The institute's projected electron microscopy will utilize the Ultramicrotome, developed recently by Dr. Fernandez-Moran which, using a diamond knife, produces ultrathin serial sections of biological tissue, bone, metal, crystal, and other hard materials.

Improved Health in Western Europe.—According to the Metropolitan Life Insurance Company, western Europe's general health, as gauged by prevailing mortality and morbidity conditions as well as by life expectancy, is better than ever, despite the relatively short period that has elapsed since the widespread privation of food, clothing, shelter, and medical services during World War II. Each of the countries studied established a new minimum death rate during the postwar period: the death rate in France fell from 13.5 per 1,000 in 1946 to 11.9 in 1954, as compared with 15 per 1,000 in the immediate prewar period; in Italy the death rate was reduced from 12.1 to 9.0 per 1,000 between 1946 and 1954, which compared with an average of about 14 per 1,000 in 1937-1939; and new low death rates were cited for Austria, Belgium, Denmark, western Germany, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, England and Wales, and Finland. Many of these countries also reported new records for life expectancy. The gains are attributed mainly to such planned activities as the restoration, soon after the war, of medical, hospital, and public health services and the subsequent expansion and improvement of these services. Wide use of the recent advances in medicine, including the antibiotics and other drugs, and a greatly increased food supply, which has raised the nutritional level of the population, also have been important factors.

CORRECTIONS

Studies with Glucagon.—In the article entitled "Studies with Glucagon in Patients with Insulin Sensitivity" in THE JOURNAL, Nov. 12, 1955, in the legend to figure 4 on page 1100 the word "glucagon" appears five times and only in the first line of the legend is it properly used. The last four times in this legend the word "glucagon" should have been "insulin."

Cost of British Health Service.—In the letter from England entitled "Nation's Health" in THE JOURNAL, Nov. 19, 1955, page 1231, the approximate per capita cost of the National Health Service should have been $31.70 instead of $317.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1956 Annual Meeting, Chicago, June 11-15.

1956 Clinical Meeting, Seattle, Nov. 27-30.

1957 Annual Meeting, New York, June 3-7.

1957 Clinical Meeting, Philadelphia, Dec. 3-6.

ANNUAL CONGRESS ON INDUSTRIAL HEALTH, Sheraton-Cadillac Hotel, Detroit, Jan. 25-24. Mr. Clark D. Bridges, 535 N. Dearborn St., Chicago 10, Acting Secretary.

AMERICAN ACADEMY OF OBSTETRICS AND GYNECOLOGY, Conrad Hilton Hotel, Chicago, Dec. 13. Dr. C. Paul Hodgkinson, 116 South Michigan Blvd., Chicago, Secretary.

AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS, Palmer House, Chicago, Jan. 28-Feb. 2. Dr. John R. Norcross, 122 South Michigan Blvd., Chicago 3, Secretary.

AMERICAN SOCIETY FOR SURGERY OF THE HAND, Chicago, Jan. 27. Dr. George V. Webster, 1145 East Green St., Pasadena 1, Calif., Secretary.

EASTERN SECTION, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, Boston, Jan. 13. Dr. John A. Murtagh, Dartmouth College, Hanover, N. H., Vice President.

LOS ANGELES MIDWINTER MEDICAL CONVENTION, Biltmore Hotel, Los Angeles, Jan. 3-5. Dr. Paul D. Foster, 1925 Wilshire Blvd., Los Angeles 58, General Chairman.

MIDDLE SECTION, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, Netherland Plaza, Cincinnati, Jan. 16. Dr. William H. Craddock, 2328 Auburn Ave., Cincinnati 19, Vice President.

NEUROSURGICAL SOCIETY OF AMERICA, Hotel Key Biscayne, Key Biscayne, Miami, Fla., Jan. 18-21. Dr. Lester A. Mount, 700 West 168th St., New York 32, Secretary.

RADIOLOGICAL SOCIETY OF NORTH AMERICA, Palmer House, Chicago, Dec. 11-16. Dr. Donald S. Childs, 713 E. Genesee St., Syracuse 2, N. Y., Secretary.

REGIONAL MEETINGS, AMERICAN COLLEGE OF PHYSICIANS:

WINSTON-SALEM, N. C., Dec. 8. Dr. Elbert Persons, Duke Hospital, Durham, N. C., Governor.

SHREVEPORT, LA., Jan. 14. Dr. M. D. Hargrove, 803 Jordan St., Shreveport, La., Governor.

PHILADELPHIA, Jan. 20. Dr. Thomas M. McMillan, 330 South 9th St., Philadelphia 7, Governor.

SASKATOON, SASK., Feb. 3-4. Dr. C. H. A. Walton, Winnipeg Clinic, Winnipeg, Man., Canada, Governor.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:

JACKSONVILLE, FLA., Hotel George Washington, Jan. 16-18. Dr. Kenneth A. Morris, 2522 Oak St., Jacksonville 4, Fla., Chairman.

SOUTH ATLANTIC ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS, Hollywood Beach Hotel, Hollywood, Fla., Jan. 28-Feb. 1. Dr. C. H. Mauzy, Bowman Gray School of Medicine, Winston-Salem, N. C., Secretary.

SOUTHERN SECTION, AMERICAN FEDERATION FOR CLINICAL RESEARCH, Jung Hotel, New Orleans, Jan. 20. Dr. John H. Moyer, 1200 M.D. Anderson Blvd., Houston, Tex., Secretary.

SOUTHERN SECTION, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, The Shamrock, Houston, Texas, Jan. 27-28. Dr. J. M. Robison, 1304 Walker Ave., Houston 2, Texas, Chairman.

WESTERN SECTION, AMERICAN FEDERATION FOR CLINICAL RESEARCH, La Playa Hotel and Golden Bough Theater, Carmel, Calif., Jan. 25. Dr. B. H. Scribner, Veterans Administration Hospital, Seattle 8, Washington, Secretary.

WESTERN SECTION, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, County Medical Society Bldg., San Francisco, Jan. 21. Dr. David D. DeWeese, 1216 S. W. Yamhill St., Portland, Ore., Vice President.

WESTERN SOCIETY FOR CLINICAL RESEARCH, Carmel-by-the-Sea, Calif., Jan. 27-28. Dr. Arthur J. Seaman, University of Oregon Medical School, Portland 1, Ore., Secretary.

FOREIGN AND INTERNATIONAL

ALL INDIA MEDICAL CONFERENCE, Jaipur, India, Dec. 26-28. Dr. B. N. Consul, Association Bldg., S.M.S. Hospital Premises, Jaipur, India, Organizing Secretary.

CANADIAN MEDICAL ASSOCIATION, Quebec, P. Q., Canada, June 10-14, 1956. Dr. Arthur D. Kelly, 150 St. George St., Toronto 5, Ont., Canada, Secretary.

CONFERENCE OF INTERNATIONAL UNION FOR HEALTH EDUCATION OF THE PUBLIC, Rome, Italy, April 27-May 5, 1956. Mr. Lucien Viborel, 92 rue St. Denis, Paris 1er, France, Secretary-General.

CONGRESS OF INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Miami Beach, Fla., U.S.A., April 9-12, 1956. For information write: Dr. R. J. Whitacre, 13951 Terrace Road, Cleveland 12, Ohio, U. S. A.

CONGRESS OF INTERNATIONAL ASSOCIATION OF LIMNOLOGY, Helsinki, Finland, July 26-Aug. 7, 1956. For information address: Dr. H. Luther, Snellmansgatan 16 C 36, Helsinki, Finland.

CONGRESS OF INTERNATIONAL ASSOCIATION OF LOGOPEDICS AND PHONIATRICS, Barcelona, Spain, Sept. 3-7, 1956. Dr. J. Perello, Provenza 319, Barcelona 9, Spain, Secretary-General.

CONGRESS OF INTERNATIONAL SOCIETY OF HEMATOLOGY, Hotel Somerset, Boston, Mass., U.S.A., Aug. 27-Sept. 1, 1956. Dr. W. C. Moloney, 39 Bay State Road, Boston, Mass., U.S.A., Secretary.

CONGRESS OF LATIN SOCIETY OF OPHTHALMOLOGY, Madrid, Spain, April 24-28, 1956. For information address: Dr. Costi, Montalban 3, Madrid, Spain.

EUROPEAN CONGRESS OF ALLERGOLOGY, Florence, Italy, Sept. 12-15, 1956. Prof. Umberto Serafini, Instituto de Patologia Medica, Viale Morgagni, Florence, Italy, Secretary-General.

EUROPEAN CONGRESS OF CARDIOLOGY, Stockholm, Sweden, Sept. 10-14, 1956. Dr. Karl Erik Grewin, Sodersjukhuset, Stockholm, Sweden, General Secretary.

EUROPEAN SYMPOSIUM ON VITAMIN B12, Hamburg, Germany, May, 1956. For information write: Doz. Dr. H. Bauer, Nervenklinik, Hamburg-Eppendorf, Germany.

INTER-AMERICAN CONGRESS OF CARDIOLOGY, Havana, Cuba, Nov. 4-10, 1956. For information address: Dr. Ramon Aixala, Apartado 2108, Havana, Cuba.

INTERNATIONAL ACADEMY OF PATHOLOGY, Cincinnati, Ohio, U. S. A., April 24-25, 1956. Dr. F. K. Mostofi, Armed Forces Institute of Pathology, Washington 25, D. C., U. S. A., Secretary.

INTERNATIONAL CONGRESS AGAINST ALCOHOLISM, Istanbul, Turkey, Sept. 10-15, 1956. For information address: International contre l'Alcoolisme, Case Gare 49, Lausanne, Switzerland.

INTERNATIONAL CONGRESS OF ANTHROPOLOGICAL AND ETHNOLOGICAL SCIENCES, Philadelphia, Pa., U. S. A., Sept. 2-9, 1956. Dr. William N. Fenton, National Research Council, Division of Anthropology and Psychology, 2101 Constitution Avenue, Washington 25, D. C., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST, Cologne, Germany, Aug. 19-23, 1956. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Illinois, U. S. A., Executive Director.

INTERNATIONAL CONGRESS OF ENTOMOLOGY, Montreal, Canada, Aug. 17-25, 1956. Mr. J. A. Downes, Science Service Bldg., Carling Ave., Ottawa, Ont., Canada, Secretary.

INTERNATIONAL CONGRESS OF GASTROENTEROLOGY, London, England, July 18-21, 1956. Mr. Hermon Taylor, London Hospital, White Chapel, London E.1, England, Honorable Secretary.

INTERNATIONAL CONGRESS FOR THE HISTORY OF SCIENCE, Florence and Milan, Italy, Sept. 3-10, 1956. Dr. M. L. Bonelli, Instituto di Ottica, Arcetri, Florence, Italy, Secretary-General.

INTERNATIONAL CONGRESS OF HUMAN GENETICS, Copenhagen, Denmark, Aug. 1-6, 1956. For information address: The University Institute for Human Genetics, Tagensvej 14, Copenhagen N, Denmark.

INTERNATIONAL CONGRESS OF HYDATID DISEASE, Athens, Greece, Sept. 14-18, 1956. Prof. B. Kourias, Croix-Rouge Hellenique, 1 rue Mackenzie King, Athens, Greece, Secretary-General.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Madrid, Spain, Sept. 19-23, 1956. Dr. J. C. De Oya and Dr. J. Gimena, Hostaleza No. 90, Madrid, Spain, Secretaries.

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Palmer House, Chicago, Illinois, U. S. A., Sept. 9-13, 1956. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF NEO-HIPPOCRATIC MEDICINE, Montecatini, Terme, Italy, May 20-22, 1956. Dr. Valente, 41 Avenue Verdi, Montecatini Terme, Italy, Secretary-General.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Copenhagen, Denmark, July 22-27, 1956. Professor P. Plum, Rigshospitalet, Copenhagen, Denmark, President.

INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE, Copenhagen, Denmark, August 20-24, 1956. Dr. B. Strandberg, Kobenhavns amts sygehus i Gentofte, Dept. of Rheumatology and Physical Medicine, Hellerup, Denmark, Honorable Secretary.

INTERNATIONAL CONGRESS OF PHYSIOPATHOLOGY OF ANIMAL REPRODUCTION AND ARTIFICIAL INSEMINATION, Cambridge, England, June 25-29, 1956. For information address: Dr. Joseph Edwards, Production Division, Milk Marketing Board, Thames Ditton, Surrey, England.

INTERNATIONAL CONGRESS OF RADIOLOGY, Mexico, D. F., Mexico, July 22-28, 1956. Dr. Jose Noriega, Tepic 126 (2e piso), Mexico, D. F. 7, Mexico, Secretary General.

INTERNATIONAL CONGRESS OF WORLD CONFEDERATION FOR PHYSICAL THERAPY, Hotel Statler, New York, New York, U. S. A., June 17-23, 1956. For information address: Miss Mildred Elson, American Physical Therapy Association, 1790 Broadway, New York 19, New York, U. S. A.

INTERNATIONAL GENETICS SYMPOSIUM, Tokyo and Kyoto, Japan, Sept. 6-12, 1956. For information address: Secretary, International Genetics Symposium, Science Council of Japan, Ueno Park, Tokyo, Japan.

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INTERNATIONAL PHYSIOLOGICAL CONGRESS, Brussels, Belgium, July 29-Aug. 5, 1956. For information address: Prof. J. Reuse, Faculte de Medicine et de Pharmacie, 115 Boulevard de Waterloo, Brussels, Belgium.

INTERNATIONAL PROFESSIONAL UNION OF GYNECOLOGISTS AND OBSTETRICIANS, Madrid, Spain, Sept. 28-29, 1956. Dr. Jacques Courtois, 1 rue Racine, St-Germain-en-Laye (S and O), France, Permanent International Secretary-General.

LATIN AMERICAN CONGRESS OF PATHOLOGY, Mexico, D. F., Mexico, Dec. 11-17. For information address: Laboratorio de Anatomia Patologica, Instituto N. de Cardiologia, Avenida Cuauhtemoc 300, Mexico 7, D. F., Mexico.

LATIN AMERICAN CONGRESS OF PHYSICAL MEDICINE, San Juan, Puerto Rico and Curacao, N.W.I., Jan. 29-Feb. 8, 1956. Dr. Cassius Lopez de Victoria, 176 East 71st St., New York 21, New York, U. S. A., Executive Director.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION, EXTRAORDINARY GENERAL ASSEMBLY, Burgenstock, Nidwalden, Switzerland, Sept. 21-23, 1956. Dr. Janet Aitken, 30a Acacia Road, London N.W. 1, England, Secretary.

NATIONAL CONGRESS OF PEDIATRICS, Cuidad Universitaria, Mexico D.F., Mexico, May 1-5, 1956. Dr. Ignacio Avila Cisneros, Calzada de Madereros No. 240, Mexico 18, D.F., Mexico, Coordinator.

NORTH QUEENSLAND MEDICAL CONFERENCE, Cairns, North Queensland, Australia, June 25-30, 1956. Dr. W. R. Horsfall, P. O Box 672, Cairns, N.Q., Australia, Secretary.

PAN-AMERICAN ACADEMY OF GENERAL PRACTICE, San Juan, Puerto Rico and Curacao, N.W.I., Jan. 29-Feb. 8, 1956. Dr. Arturo Martinez, 54 East 72d St., New York 21, New York, U. S. A., Secretary.

PAN AMERICAN CONGRESS OF GASTROENTEROLOGY, Havana, Cuba, Jan. 20-27, 1956. For information address: Dr. Norberto M. Stapler, 1267 J. E. Uriburu, Buenos Aires, Argentine, S. A.

PAN AMERICAN CONGRESS OF OPHTHALMOLOGY, Santiago, Chile, S. A., Jan. 9-14, 1956. Dr. Rene Contardo, Huerfanos 930, Of. 74, Santiago, Chile, Secretary General.

PAN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY, San Juan, Puerto Rico, April 8-12, 1956. Dr. C. E. Munoz MacCormick, Apartado 9111, Santurce 29, Puerto Rico, Secretary General.

PAN AMERICAN MEDICAL WOMEN'S ALLIANCE, Santiago, Chile, March 6-13, 1956. For information address: Dr. Eva Cutright, 458 Beall Ave., Wooster, Ohio, U. S. A.

WORLD CONGRESS ON FERTILITY AND STERILITY, Naples, Italy, May 18-26, 1956. For information address: Prof. G. Tesauro, S. Andrea della Dame, 19, Naples, Italy.

WORLD MEDICAL ASSOCIATION, Havana, Cuba, Oct. 9-15, 1956. Dr. Louis H. Bauer, 345 East 46th St., New York 17, New York, U. S. A., Secretary-General.

EXAMINATIONS AND LICENSURE

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY. *Written.* Various centers, July 26. *Oral.* St. Louis, Oct. 12-15. Sec., Dr. B. M. Kesten, One Haven Ave, New York 32.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 15, 1956. Final date for filing application is May 1. *Oral Examinations in 1956.* New Orleans, Feb. 7-10; Los Angeles, April 12-14; Chicago, June 7-9. Final date for filing application for these three oral examinations is Jan. 3. New York City, Sept. 21-25. Final date for filing application is April 1. Exec. Sec., Dr. William A. Werrell, 1 West Main St., Madison 3, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written Examination and submission of Case Reports. Part I.* Various locations in United States and Canada, and military centers outside of the Continental United States, Feb. 3, 1956. Final date for filing application was Oct. 1. *Oral and Pathological Examinations. Part II.* Chicago, May 11-20, 1956. Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* January 24-26, 1956. *Practical Examination.* San Francisco, June 18-21, St. Louis, Oct. 20-25. Applications for 1957 written examination must be filed before July 1, 1956. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland 9, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral.* Jan. 26-27. Final date for filing application was Aug. 15. *Part I. Oral and written.* Various centers, April 1956. Final date for filing application is Nov. 30. Sec., Dr. Harold A. Sofield, 116 South Michigan Ave., Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY. *Oral.* Montreal, Canada, May 6-10. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION. *Parts I and II.* Chicago, June 16-17. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

AMERICAN BOARD OF PLASTIC SURGERY. *Entire Examination.* Buffalo, May 13-15. Final date for filing case reports is Jan. 1. Corres. Sec., Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York City, December, Philadelphia, April 16-18, 1956. Sec., Dr. David A. Boyd, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: Deadline for filing applications for the Spring 1956 examination is Jan. 1. Those candidates who will complete their training by June 30, will be eligible to appear at this examination. Sec., Dr. B. R. Kirklin, Kahler Hotel Bldg., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Part I.* Centers throughout the United States, in Europe and in the Far East, March 28. Closing date for the March examination was December 1. *Part II.* St. Louis, Dec. 12-13; New Orleans, Jan 16-17; Los Angeles, Feb. 13-14; San Francisco, Feb. 16-17; Durham, March 12-13; Boston, May 14-15 and Philadelphia, June 4-5. Sec., Dr. John B. Flick, 255 S. Fifteenth St., Philadelphia 2.

BOARD OF THORACIC SURGERY. *Written.* February 1956. Closing date for filing application was Dec. 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2, Mich.

MAGAZINE–TELEVISION REPORT

The following list of current medical articles in mass-circulation magazines and forthcoming network television programs on medical subjects is published each week only for the information of readers of THE JOURNAL. *Unless specifically stated, the American Medical Association neither approves nor disapproves of the articles and programs reported.*

TELEVISION

Monday, Dec. 19

NBC-TV, 11 a. m. to 12 noon EST. "Medical and Health News with Howard Whitman," a segment of the "Home" show.

NBC-TV, 9 p. m. EST. "Medic" repeats "Red Christmas," the story of a Christmas office party that leads to a serious automobile accident.

ABC-TV, 9:30 p. m. EST. "Medical Horizons" goes to New York Hospital, Cornell University, for a report on the four functions of a hospital nurse: care of the sick, patient education, training the student nurse, and public health. Presented in cooperation with the American Medical Association.

Tuesday, Dec. 20

NBC-TV, 10:30 p. m. EST. "Big Town" features an interview with Gen. Omar Bradley on what business and industry can do to help solve the problem of the physically handicapped.

MAGAZINES

The American Weekly, Dec. 11, 1955

"Hepatitis," by William Engle

"Medical scientists in great research centers today are working in two special ways to solve the mystery of viruses such as that of infectious hepatitis. One of their aims is to perfect vaccines against virus diseases or synthetic antibodies to attack the viruses."

Collier's, Dec. 9, 1955

". . . 65 and Over"

A preview look at a survey on "Economic Needs of Older People," to be published in January by the Twentieth Century Fund. In answering the question "How Is Their Health?" the article says: "From one tenth to one third of all Americans sixty-five or older are chronically ill, and most persons over sixty have some more-or-less permanent disability or disease."

Coronet, December, 1955

"Dear Doctor . . ."

Contains extracts from a new book with that title, which reproduces "unintentionally funny letters" received by doctors.

GOVERNMENT SERVICES

ARMY

Reserve Participation Possible Prior to Doctor's Active Duty.—Seniors in approved American medical schools planning to enter the Army Reserve Medical Corps after graduation next June can begin earning reserve credits at once if they accept their commissions early this winter. Col. Joseph H. McNinch, chief, personnel division, surgeon general's office, said, "With the emphasis being placed now on Reserve service in today's defense blueprints, this is an important consideration the prospective physician may overlook if he postpones sending in his completed application form to the proper Army officials."

These application forms concern participation in the armed forces reserve medical officer commissioning and residency consideration program now in operation. Under this program, evolved by the Department of Defense and the Selective Service System to insure the continuing supply of properly trained doctors for the nation, the medical senior may combine his military obligation and his intern and residency training. He may have up to three years in residency instruction in the medical specialties needed to safeguard the health of the fighting man.

"Processing of commissions in the Medical Corps, Army Reserve, requires a minimum of two months and in some instances, a longer period," said Colonel McNinch. "Consequently, the sooner the senior or the intern gets his papers in . . ., the earlier he will eliminate any uncertainty about his future plans for military duty and the possibility of any interference with his professional progress. It is possible that the senior who waits too long to file his acceptance of an appointment may have to serve on enlisted status until his commission papers are processed."

Col. James H. Kidder, special assistant to the surgeon general for reserve forces, said, "The many advantages of this fine program stem from the opportunity it offers the senior medical student to know reasonably well in advance how he is going to fit his plans for medical training and practice into his military service. One primary advantage is that the choice of service may be made by the individual rather than by the Department of Defense, so long as this choice is within the desired allocations and proportions required by the services."

NAVY

Hospital Corpsman Earns Ph.D. While on Active Duty.—By attending classes during off-duty hours for about nine and one-half years, hospital corpsman first class Albert D. Jenkins has acquired bachelor, master, and doctorate degrees, conferred by the University of Edinburgh, Scotland, where he met entrance requirements before joining the Navy in January, 1943. He attained a B.S. degree in five and one-half years by attending Boston College and Harvard Medical school while attached to the Naval Hospital at Chelsea, Mass., and by attending the University of Washington while assigned to the Bremerton Naval Hospital. For a masters degree, he attended the University of Hawaii while on duty at the Tripler General Hospital in Honolulu. The subject of his thesis for a masters degree was "Experimental Psychology, the Adult Male." He has acquired a Ph.D. in clinical psychology. All credits for his work in other colleges and universities were transferred to the University of Edinburgh.

Born in 1926, in Portland, Maine, he served aboard a Landing Ship Tank during the invasion of Okinawa; while in service, he was credited with saving many lives when his ship was hit repeatedly and was awarded the Bronze Star medal. During the Korean campaign he served in both Japan and Korea. Jenkins completed training at the Navy Submarine School in April, 1955, and now is assigned to the submarine USS Ray.

Personal.—Lieut. Pauline E. Clarke, who was recently commissioned in the Medical Corps of the Navy, is one of five women doctors in the regular Navy. Lieut. Clarke is presently on duty at the Naval Dispensary, Washington, D. C.

ATOMIC ENERGY COMMISSION

Fellowships in Industrial Medicine.—The U. S. Atomic Energy Commission offers eight fellowships providing advanced training and on-the-job experience in industrial medicine, particularly in relation to the atomic energy industry. The program will be administered by the atomic energy project, University of Rochester (N. Y.) School of Medicine and Dentistry. The fellowships are open to men and women physicians who are citizens of the United States, who have graduated from an approved college of medicine at least two years before beginning tenure of the fellowship, and who are licensed to practice medicine in one of the states or territories of the United States. Successful candidates will be required to have a full F. B. I. background investigation and to be cleared by the commission before award of a fellowship. Applications for the academic year 1956-1957 should be filed before Jan. 1, 1956. It is expected that the selection of fellows will be made on or before Feb. 1, 1956, but fellowships may be assigned at any time at the discretion of the committee. The stipend during a fellowship or academic year is $3,600. The sum of $350 is added to the total stipend for a wife, and $350 more is added for each dependent child. Tuition and laboratory fees, which would be required of students of similar university status, will be paid in academic courses. Certain other expenses incident to the work will be paid when approved by the committee. During the in-plant year of training, the stipend will be $6,000. The fellowship year of academic training may be taken at a university offering an approved graduate course in industrial medicine that can provide special training facilities in the health problems associated with the atomic energy program. The in-plant year of training will be given at A. E. C. contractor installations such as Oak Ridge, Tenn., Los Alamos, N. Mex., Richland, Wash., and other areas where there are major industrial medical units. Address all inquiries to: A. E. C. Fellowships in Industrial Medicine, Atomic Energy Project, University of Rochester, School of Medicine and Dentistry, Rochester 20, N. Y. Attention: Henry A. Blair, Ph.D.

PUBLIC HEALTH SERVICE

Personal.—Dr. T. D. Dublin has been appointed to the staff of the National Institutes of Health, with special assignment to community services programs. He will assist Dr. C. J. Van Slyke, associate director (for extramural affairs), and the staffs of the seven Institutes. Dr. Dublin has been a special consultant to the National Foundation for Infantile Paralysis for planning and organization of the poliomyelitis vaccine field trial. Formerly the executive director of the national health council, Dr. Dublin received his M.D. degree from Harvard University and a Dr.P.H. degree from Johns Hopkins University.

MISCELLANEOUS

Grants-in-Aid.—The Division of Medical Sciences, National Academy of Sciences-National Research Council, is accepting applications for grants-in-aid of research in three specialized fields: 1. The Committee on Problems of Alcohol is interested in fostering research, primarily on the physiological, biochemical, and pharmacological effects of alcohol. Applications should be postmarked not later than Jan. 15, 1956. 2. The Committee for Research in Problems of Sex, concerned with encouraging research primarily on the mechanisms controlling sexual behavior in animals and man, invites proposals involving endocrinological, neurological, psychological, anthropological, phylogenetic, and genetic studies directed toward this objective. Requests will also be considered that deal with the physiology of reproduction or with related biological and biochemical fields. Applications should be postmarked on or before Feb. 1, 1956. 3. The Committee on Drug Addiction and Narcotics invites applications for the support of research in analgesia and addiction and will welcome information on basic research being carried on in these fields. For application blanks, write to the appropriate committee of the Division of Medical Sciences, National Academy of Sciences-National Research Council, 2101 Constitution Ave. N. W., Washington 25, D. C.

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DEATHS

Ames, Azel ✦ Hamilton, Ohio; born in Newton, Mass., Feb. 10, 1903; Columbia University College of Physicians and Surgeons, New York City, 1927; interned at the New York and Presbyterian hospitals in New York City; formerly a resident in surgery at the Cincinnati General Hospital; at one time assistant professor of surgery at the State University of Iowa College of Medicine, Iowa City; specialist certified by the American Board of Surgery; certified by the National Board of Medical Examiners; member of the Society of University Surgeons and the American Trudeau Society; past-president of the Butler County Medical Society and the Hamilton Academy of Medicine; served on the medical service plans committee of the Ohio State Medical Association and on the Butler County Advisory Board of Health; president of the Butler County Tuberculosis and Health Association and past-president of the Ohio Tuberculosis and Health Association; for a short time a lieutenant commander in the U. S. Naval Reserve during World War II; on the staff of the Hughes Memorial Hospital; associated with the Fort Hamilton Hospital and the Mercy Hospital, where he was chief of staff, and where he died Sept. 24, aged 52, of coronary thrombosis.

Luce, Henry Ashley ✦ Detroit; born Oct. 16, 1874; Detroit College of Medicine, 1905; clinical assistant professor of psychiatry at his alma mater, now known as the Wayne University College of Medicine; member of the House of Delegates of the American Medical Association in 1924 and from 1931 to 1946; charter member and past-president of the East Side Medical Society; past-president of the Michigan State Medical Society and the Wayne County Medical Society; in 1919 president of the Detroit College of Medicine and Surgery Alumni Association; served during World War I; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; fellow of the American College of Physicians; medical director, Michigan Society for Mental Hygiene; in 1938 named to a seven man advisory committee for the expansion of public health activities in Michigan; on the staffs of the Evangelical Deaconess, City of Detroit Receiving, and Harper hospitals, the Eloise Hospital and Infirmary, and the Jennings Memorial Hospital, where he died Oct. 28, aged 81, of pneumonia.

Simpson, Leo Francis ✦ Rochester, N. Y.; born June 26, 1884; University of Buffalo School of Medicine, 1905; specialist certified by the American Board of Surgery; member of the House of Delegates of the American Medical Association, 1950 and 1951; fellow of the American College of Surgeons and the International College of Surgeons; past-president of the Medical Society of the State of New York, Monroe County Medical Society, and the Rochester Academy of Medicine; associated with the Strong Memorial Hospital, Monroe County Infirmary, and the Park Avenue Hospital; in 1952 awarded an honorary degree of doctor of science by the St. Bonaventure University; died Oct. 31, aged 71, of coronary disease.

Corey, Giles Patterson, Greenville, N. C.; born in Greenville, N. C., Aug. 19, 1925; Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, 1951; interned at the Jefferson Hillman Hospital in Birmingham, Ala., where he served a residency in surgery; appointed a lieutenant (j. g.) in the Medical Corps of the U. S. Naval Reserve on Aug. 31, 1953; reported for active duty on Oct. 30, 1953, at the Naval Auxiliary Air Station, Barin Field, Foley, Ala.; in April, 1954, reported to the USS Antietam; promoted to the grade of lieutenant on July 2, 1954; remained in that assignment until Sept. 2, 1955; died in the Duke Hospital, Durham, Oct. 23, aged 30.

Barstow, William Edwin ✦ St. Louis, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905; past-president of the Michigan State Medical Society and served as councilor of the Eighth District; past-president of the Gratiot-Isabella Clare Counties Medical Society; past-president of the school board; charter member and past-president of the Rotary Club; for many years active in boy scout work and was given the Silver Beaver award; died in the Providence Hospital, Detroit, Oct. 6, aged 78, of pericarditis and myocardial infarction.

Ahlquist, Richard Elmer ✦ Spokane, Wash.; Denver and Gross College of Medicine, 1910; also a graduate in pharmacy; governor of the American College of Surgeons; charter member and first president of the Spokane Surgical Society; past-president of the North Pacific Surgical Society; served during World War I; district surgeon for the Union Pacific Railroad Company; on the staffs of the Deaconess Hospital, Sacred Heart Hospital, and St. Luke's Hospital, where he died Oct. 12, aged 67, of carcinoma of the head of the pancreas.

Axelson, Axel U. ✦ Detroit; Detroit College of Medicine and Surgery, 1918; member of the American Academy of General Practice; an associate member of the International College of Surgeons; on the staffs of the Woman's, St. Joseph's, and Florence Crittenton hospitals; died Sept. 5, aged 66, of ruptured aneurysm of the aorta.

Beebe, Hugh McDowell ✦ Ann Arbor, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1907; served on the faculty of his alma mater and of the University of Michigan Medical School; fellow of the American College of Surgeons; served during World War I; on the staff of the St. Joseph Mercy Hospital, where he died Oct. 3, aged 72, of myocardial infarction.

Benson, John Charles ✦ Flint, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; past-president of the Genesee County Medical Society; on the staffs of the Hurley, St. Joseph, and McLaren General hospitals; died Oct. 9, aged 77, of aplastic anemia.

Boeckmann, Egil ✦ St. Paul; University of Pennsylvania Department of Medicine, Philadelphia, 1905; member of the American Academy of Ophthalmology and Otolaryngology; died in Dellwood, Minn., Sept. 3, aged 73, of pneumonia.

Burns, Keith Gillies ✦ Seattle; Queen's University Faculty of Medicine, Kingston, Canada, 1924; member of the American Trudeau Society and the American Academy of General Practice; on the staffs of the Seattle General and Providence hospitals; died in Parry Sound, Ontario, Canada, July 4, aged 57, of coronary disease.

Cascio, Domenico, Atlantic Highlands, N. J.; Regia Università degli Studi di Messina, Facoltà di Medicina e Chirurgia, Italy, 1923; died in Middletown July 5, aged 59, of cerebral hemorrhage.

Chase, Robert Logan ✦ Glasgow, Ky.; Western Reserve University School of Medicine, Cleveland, 1943; interned at the Peoples Hospital in Akron, Ohio; served during World War II; on the staff of the T. J. Sampson Community Hospital; died Oct. 9, aged 37, of injuries received in an automobile accident.

Chilton, William Ernest ✦ Fort Worth, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1900; fellow of the American College of Surgeons; served during World War I; on the staffs of the W. I. Cook Memorial Hospital Center for Children, City-County Hospital, All Saints Hospital, and St. Joseph's Hospital; died Oct. 27, aged 78, of monocytic leukemia.

Collom, Spencer Allen Jr. ✦ Texarkana, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1929; fellow of the American College of Surgeons; served during World War II; on the staff of the Texarkana (Texas) Hospital and St. Michael's Hospital in Texarkana, Ark.; co-founder and president of the Temple Memorial Home for Crippled Children; died Oct. 10, aged 51.

✦ Indicates Member of the American Medical Association.

De Moully, Oliver Martin ✦ Flasher, N. D.; Marquette University School of Medicine, Milwaukee, 1919; local health officer; died in St. Alexius Hospital, Bismarck, July 26, aged 64, of squamous cell carcinoma.

Dufty, George Watson, Nassau, N. Y.; Albany (N. Y.) Medical College, 1910; for many years county coroner; on the staff of the Samaritan Hospital in Troy; died Oct. 9, aged 72, of a heart attack.

Evans, Thomas Jr., Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1905; an associate member of the American Medical Association; member of the Medical Society of the State of Pennsylvania; past-president of the Pittsburgh Gynecology Society; served on the staffs of the Pittsburgh, Columbia, and St. Mark's hospitals; died Oct. 23, aged 76.

Forbes, David Arthur, Seattle; Williamette University Medical Department, Salem, Ore., 1907; died in Maynard Hospital Sept. 26, aged 80.

Foster, Eli Norman, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1903; an associate member of the American Medical Association; served during World War I; died in the Veterans Administration Hospital, Oakland, Oct. 19, aged 75.

Gerry, Frank Henry ✦ Arlington, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1920; member of the American Society of Anesthesiologists; at one time school physician; served during World War I; on the staff of Symmes Hospital in Arlington and Chelsea (Mass.) Memorial Hospital; died in Bedford Oct. 25, aged 62, of coronary sclerosis.

Goldstone, Walter ✦ Brooklyn; Université de Lausanne Faculté de Médecine, Switzerland, 1942; on the staffs of the Cumberland and Prospect Heights hospitals; died Aug. 12, aged 40, in the ship disaster of the Levin J. Marvel on Chesapeake Bay, Md.

Hammond, Walter Jean, Laconia, N. H.; Medical School of Maine, Portland, 1912; member of the New England Society of Psychiatry and the New Hampshire Medical Society; died Aug. 1, aged 74, of acute coronary thrombosis.

Hayman, Charles Stanley ✦ Boscobel, Wis.; Rush Medical College, Chicago, 1895; died Aug. 11, aged 83, of carcinoma of the prostate.

Hood, William Andrew ✦ Hickory Grove, S. C.; College of Physicians and Surgeons, Baltimore, 1889; died in the Divine Saviour Hospital, York, Oct. 4, aged 86, of arteriosclerosis.

Knutson, Olaf A., Buxton, N. D. (licensed in North Dakota in 1904); member of the North Dakota State Medical Association; died in Grand Forks Sept. 25, aged 76.

Le Doux, Morris Stirling, Rayne, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1923; member of the Louisiana State Medical Society; fellow of the American College of Surgeons; past-secretary of the Shreveport Medical Society; for a long time on the staff of the Highland Sanitarium in Shreveport; died in the Lafayette (La.) Sanitarium Sept. 28, aged 57.

McCann, Eugene John ✦ Minneapolis; University of Minnesota Medical School, Minneapolis, 1931; served during World War II; on the staffs of the Veterans Administration Hospital, St. Andrew's Hospital, St. Mary's Hospital, and St. Barnabas Hospital, where he died Aug. 20, aged 51, of carcinoma.

McNeeley, Hugh Lyle, Cleveland; University of Wooster Medical Department, Cleveland, 1909; on the emeritus staff of St. Vincent Charity Hospital, where he died Sept. 16, aged 69, of coronary thrombosis.

Maguire, Richard Aloysius, Somerville, Mass.; Boston University School of Medicine, 1935; interned at the Carney Hospital in Boston; died in West Medford Sept. 9, aged 48, of brain tumor.

Mershon, Glenn Earl ✦ Mount Carroll, Ill.; Barnes Medical College, St. Louis, 1901; on the staffs of the Savanna City (Ill.) Hospital, Deaconess and St. Francis hospitals in Freeport; died Oct. 8, aged 79, of coronary thrombosis.

Metcalf, Henry Martyn ✦ Hendrysburg, Ohio; University of Pennsylvania Department of Medicine, Philadelphia, 1905; served on the staff of Elyria (Ohio) Memorial Hospital; died in Albion, N. Y., July 19, aged 83, of coronary occlusion.

Murphy, Lawrence ✦ Newburyport, Mass.; St. Louis College of Physicians and Surgeons, 1925; died Sept. 22, aged 60, of coronary thrombosis.

Outlaw, Jackson Kent ✦ Albemarle, N. C.; Syracuse University College of Medicine, 1923; interned at the New York City Hospital; died in the Baptist Hospital, Winston-Salem, N. C., Sept. 28, aged 59, of arteriosclerotic heart disease.

Rochester, Gertrude, New York City; Cornell University Medical College, New York City, 1899; an associate member of the American Medical Association; served on the staffs of the Bellevue, New York Postgraduate, and Manhattan Eye, Ear and Throat hospitals; died in the New York Hospital Nov. 9, aged 77.

Sifritt, Neuman, Marion, Ohio; Eclectic Medical Institute, Cincinnati, 1896; also a pharmacist; for many years county health officer; served on the executive board of the Ohio Public Health Association; died Oct. 16, aged 84.

Speidel, Frederick W. ✦ Senath, Mo.; Louisville (Ky.) Medical College, 1892; died in the Presnell Hospital, Kennett, July 29, aged 86, of gangrene of the left foot and leg.

Stone, Alvin Alexander, Shaker Heights, Ohio; Western Reserve University School of Medicine, Cleveland, 1913; died Sept. 28, aged 68, of hypertensive cardiovascular disease.

Stone, Theodore Croft, Greenville, S. C.; Medical College of the State of South Carolina, Charleston, 1903; died in the Transylvania Community Hospital, Brevard, N. C., Sept. 24, aged 81, of coronary thrombosis and cardiovascular renal disease.

Tillottson, Squire Fountain, Pilot Mountain, N. C.; North Carolina Medical College, Davidson, 1905; died in the North Carolina Baptist Hospital, Winston-Salem, Sept. 12, aged 72, of myocardial infarction.

Tippet, Walter P. ✦ Green Bay, Wis.; University of Illinois College of Medicine, Chicago, 1925; served as secretary and president of the Brown-Door Kewanee Counties Medical Society; served during World War I and was decorated with the Croix de Guerre and the Purple Heart; president of the Bellin Memorial staff; trustee of Lawrence College, Appleton; died Sept. 12, aged 60, of coronary disease.

Tolle, Charles Banta ✦ Pontiac, Mich.; University of Michigan Medical School, Ann Arbor, 1942; interned at the University Hospital in Ann Arbor, where he served a residency in pathology; served in the regular Navy and during World War II; secretary-treasurer of the Oakland County Medical Society; clinical laboratory director at St. Joseph Mercy Hospital; died Oct. 22, aged 37, of arteriosclerosis.

Torrance, Adam Morton, Harpursville, N. Y.; University of Toronto Faculty of Medicine, Toronto, Canada, 1923; member of the Medical Society of the State of New York; served during World War II; health officer, school physician, and surgeon for the Delaware and Hudson Railroad; on the staffs of the City and Our Lady of Lourdes hospitals in Binghamton; died Sept. 25, aged 55, of coronary occlusion.

Van Kirk, Asher W., Seattle; College of Physicians and Surgeons, Baltimore, 1907; served during World War I; died in the Veterans Administration Hospital Oct. 19, aged 73.

Vertuno, Louis Abbott, Oak Park, Ill.; Chicago College of Medicine and Surgery, 1911; on the emeritus staff of the Oak Park Hospital; died in Elgin, Ill., Oct. 13, aged 72, of cerebral arteriosclerosis.

Willis, John Buren ✦ Mayview, Mo.; Barnes Medical College, St. Louis, 1897; served during World War I; died in the Veterans Administration Hospital, Kansas City, Mo., Oct. 25, aged 81, of coronary occlusion.

Wood, George H. ✦ Onaway, Mich.; Saginaw Valley Medical College, Saginaw, 1901; served on the staffs of the Delray and Michigan Mutual Industrial hospitals; died in Lansing Sept. 16, aged 81, of coronary occlusion.

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FOREIGN LETTERS

AUSTRIA

Serum Proteins in Patients with Concussion.—At the meeting of the Society of Physicians in Vienna on Oct. 7, Dr. E. Neumayer reported that he subjected the serum of 25 patients with cranial trauma (of whom 14 showed clinical signs of concussion, 3 signs of contusion, and 8 no evidence of concussion) to paper electrophoresis. There was dysproteinemia, and, at the end of the first week of illness, there was a further shift in the serum proteins that did not depend on injuries of bone or soft tissues. These findings corresponded with the course of other autonomic reactions after concussion in patients who, at the end of the first week of illness, showed signs of autonomic ataxia. These findings, in combination with the centrally localized trauma, are evidence of the central influence exerted on the relative proportions of the serum proteins. Furthermore, by correlation with the clinical aspect, a criterion was obtained for the presence or absence of the concussion syndrome, since the change in the serum proteins did not occur until after the end of the first week of illness when clinical evidence of concussion was seen.

Dysfunction of Adrenal Cortex.—At the same meeting, Husslein and Schüller reported that disturbances of the menstrual cycle in women, or more or less pronounced abnormalities in the reproductive organs in girls, may be the first symptoms of adrenocortical dysfunction. Because the gynecologist is often the first to be consulted when such a disturbance occurs, he should study these phenomena that otherwise lie in the domain of the internist. An analysis of hormones from the urine is an aid in making the diagnosis. The determination of the neutral 17-ketosteroid and the corticosteroids is an aid to diagnosis. In one of the authors' patients with a postpubertal form of adrenocortical hyperplasia, it was possible to relieve the secondary amenorrhea with cortisone and to obtain a diphasic menstrual cycle. After treatment, the patient, who had been sterile, was able to conceive.

Electrocoagulation of Cervical Erosion.—At the October meeting of the Austrian Society of Gynecologists and Obstetricians in Vienna, Dr. V. Grünberger stated that according to the literature electrocoagulation is the method of choice for the treatment of cervical erosion. It should be preceded by special examinations to rule out carcinoma. The case is described of a 49-year-old woman whose Papanicolaou test was negative on three occasions. Colposcopy repeated after six weeks was also negative for any evidence of cancer. After a year clinical and colposcopic findings and smears raised suspicion. Curettage revealed an epidermoid carcinoma. Reexamination of the old vaginal smears revealed evidence that carcinoma was probably present at the time of the first examination. Cytological diagnoses should therefore be made only by an expert. Follow-up examinations after electrocoagulation are necessary up to the time of healing, which should be complete within about six weeks. Development of carcinoma of the cervix after coagulation is extremely rare.

BELGIUM

Medical Liberty.—A special session of the Belgian Society for International Medical Law was held in Liege to study the international tendency toward institutionalization in medicine. Professor De Busscher spoke in favor of traditional medicine with its spirit of sacrifice, disinterestedness, and implicit obligations of care. In some physicians an unfortunate mercenary spirit has grown up that is a stain on the profession. Patients of the poorer classes need pay only a third of their medical expenses, but this amount should be scrupulously collected so as not to harm the physician-patient relationship. The session had a special significance in view of the protest on the part of Belgian physicians against the recent decisions by the Public Health Administration that all medical fees would be paid directly by the Medical Insurance and Social Security Administrations instead of by the patient and that the physicians of these insurance organizations would check all declarations and certificates issued by treating physicians. Physicians in private practice refused to apply these measures and went on strike, not against the patients but against the administration. They achieved their result by simply not filling out any of the forms required by the two organizations. In the face of this mass movement, the ministry suspended its decision and new negotiators were engaged to arbitrate disagreements between the medical profession and the government.

The items in these letters are contributed by regular correspondents in the various foreign countries.

ENGLAND

Mental Hospitals.—In the *Lancet* of Oct. 29, page 917, Dr. J. Bickford describes the plight of what he calls the medically forgotten patient, that is, the chronic psychotic patient for whom little is done, except to provide essential clothing, food, and shelter. Many elderly patients are retained in mental hospitals for social rather than medical reasons. If they were nursed elsewhere the bed shortage would be greatly relieved. The business of a hospital is to cure patients, not to hoard them, and the sheltering of patients in a hospital without any effort to make them well is a complete denial of the functions of medicine. Dr. Bickford also deplores the temporary solution of the shortage of nurses in mental hospitals. The number of assistant nurses, who have no intention of qualifying, is being multiplied, but nurses of this grade cannot undertake responsible work or supervise treatment. They act merely as custodians. During visits by laymen to mental hospitals, emphasis is placed on the admission wards, convalescent villas, and occupational therapy, but not on the plight of the chronic psychotic patient. The physicians have little incentive to discharge these patients, because, if there are any empty beds, the regional hospital board will fill them up with the unwanted patients of other hospitals or with foreign patients who know no English. The existence of these foreign patients is a problem in British mental hospitals because no verbal contact can be made with them by psychiatrists or nurses. Nearly every hospital has 5 or 10 such patients. Another reason for not discharging patients from the mental hospitals is the possible reduction in the senior nursing staff. The Board of Control does not help the chronic mental patient. It exists to see that patients are not illegally detained. Inspections of hospitals by the board's commissioners sometimes take less than an hour. Research into chronic mental illness is not encouraged because young psychiatrists find work in general hospitals and "domiciliary" visits more rewarding. Psychiatrists rarely have the care of chronic psychotics. About a third of all patients in mental hospitals are permanent inmates. They are clad in shapeless garments, and, if they are allowed out of bed, they never wear shoes. Too often they are regarded as objects of disgust and ridicule, and sometimes it seems that the attention paid them is less than that accorded to the hospital's pigs.

Nuffield Health Centers.—When the new national health scheme was being envisaged before 1948 many health centers were planned. These buildings, in which general practitioners were to treat their patients as part of a group practice system, have remained largely in the blueprint stage owing to the unexpected high cost of the health service. Only a few have been built as experiments by the local authorities in association with the Ministry of Health. This has caused dissatisfaction to many practitioners who thought that they could offer better service to their patients through health centers. There is little possibility of their being built now except in new towns, growing suburbs,

and rebuilt areas. An example of careful planning of these centers without excessive cost has been set by the Nuffield Provincial Hospitals Trust. Owing to its initiative and generosity, three health centers have been finished and were officially opened by Lord Nuffield on Oct. 17. These three centers form part of a $728,000 scheme by the trust to provide a comprehensive medical service not under state control to serve an eventual population of 80,000 that is expected to be reached at the new town of Harlow in Essex. Under this scheme the general practitioner service will be integrated with an industrial health service and the proposed new Harlow hospital. It is hoped that three more health centers in the town and two industrial health centers will be provided. In addition to facilities for general practitioners there will also be orthopedic, ophthalmologic, speech therapy, and child guidance clinics and investigation units working in connection with the local hospital. Since November a nonprofit company of industrialists has operated an industrial health service for the 5,766 people working at present in Harlow. In the past there has been some doubt as to whether x-ray and pathology departments should be included in the health centers, because it was feared that they might be uneconomical. At Harlow the Nuffield Trust will probably make the experiment. The centers at Harlow are not health centers as originally envisaged in the terms of the National Health Service, since dentists may practice privately there. The rent of a single furnished room used as an office is $364 per annum, plus a local tax. Physicians must provide secretaries. The trust aims at evolving a pattern of comprehensive medical care in Harlow that may prove a future guide to other communities.

Effects of Smoking.—Oswald and Medvei have conducted an investigation on the effect of cigarette smoking on the incidence of bronchitis, using civil servants as clinical material (*Lancet* **2**:843, 1955). The Civil Service has a large number of employees available for questioning, and groups of similar age, sex, occupation, income, and domestic circumstance, with similar degrees of exposure to the dangers of respiratory infection and atmospheric pollution, can be selected for study. The investigation was limited to the staffs of the Treasury and the Ministry of Supply in London, and, of these, 5,844 clerical workers were interviewed. The age range was 16-65, so that no opinion could be expressed on the effect of smoking on bronchitis in persons over the age of 65. The subjects were classified as smokers if they had smoked five or more cigarettes a day for five or more years; if they had smoked less than this they were classified as nonsmokers. They were further classified as having no pulmonary symptoms; occasional or habitual morning cough or sputum; mild bronchitis; moderate bronchitis; or severe bronchitis. The emphasis in grading was on symptoms and disability. Seventy-six per cent of the employees had had radiographs of the chest taken within the previous five years. Of the 782 employees regarded as having bronchitis, 74% were in the mild, 22% in the moderate, and 4% in the severe group. The most striking feature of the survey was that in every instance the proportion of employees having mild respiratory symptoms and bronchitis was consistently higher among smokers than in nonsmokers. The prevalence of bronchitis was 16% in all smokers and 9.4% in the nonsmokers. For the entire series, 36% of the smokers were free from respiratory symptoms, compared with 53% of the nonsmokers.

Silicosis in Ironworks.—A suit was brought by a molder against an iron foundry for which he had worked for 25 years. The molder worked in a large room with a floor of sand, filling molds with molten iron and opening them when the metal had cooled. In the last process adherent sand was "knocked off" the castings and in the process clouds of sand dust were formed. The worker was also exposed to the sand clouds raised by fellow workers. It was not appreciated until 1950 that this process was dangerous to health and caused fracture of the grains of sand, which, when inhaled, could cause silicosis. By 1946 this worker contracted the disease; two years later it was incurable. By 1954 his expectation of life was only 15 years, although he was in his early 40's. In his suit he stated that he should have been protected by a mask or respirator. At the hearing it was stated that it would require 15 years' exposure to the fine sand particles for incurable silicosis to develop. Although 20 types of respirators were available, it was shown that in the light of recent knowledge only one of them, the Mark IV, would have been effective in filtering out the fine particles, so that if any others had been used they would not have prevented the disease from progressing. The judge ruled that Mark IV respirators should have been provided, and he awarded damages of $26,900 for loss of expectation of life, loss of earning capacity, and inability of the plaintiff to provide for his dependents. The Court of Appeal directed a new trial on the question of whether failure to provide Mark IV respirators was in fact a breach of the employers' obligation in view of the state of knowledge at the time.

Treatment of Tuberculosis.—Aminosalicylic acid combined with isoniazid has been shown to be tuberculostatic in vitro. Dr. J. Clegg has carried out a small pilot study to determine if the compound is effective in the treatment of human tuberculosis and to see how quickly it produces resistance (*Brit. M. J.* **2**:1004, 1955). Because on ethical grounds it was considered undesirable to treat new patients with the new compound, and as it seemed that it would prove of value in patients infected with strains already resistant to streptomycin, isoniazid, and aminosalicylic acid, it was stipulated that the selected patients should (1) have chronic pulmonary tuberculosis, with one or more cavities and a strongly positive sputum; (2) be unsuitable for any treatment other than with antibacterial drugs; (3) have had at least three months' treatment with aminosalicylic acid or isoniazid, alone, or in combination, some time previously; (4) have had no change in treatment in the preceding two months; and (5) be likely to remain under treatment for at least three months. Twenty-five patients were selected, but only 17 completed the required treatment. They were given 600 mg. of the compound daily in three equal doses for three months. In none of them did full resistance to the compound develop. Partial resistance occurred in 10 patients. A lowering of the positivity of the sputum occurred in nearly all patients. There was no change in one case, a marked drop in 10, and sputum conversion in 6. In the last group none had previously had sputum conversion under treatment.

Effect of Hypothermia on Vital Organs.—Although it has been held that no gross alterations in tissue structure can be ascribed to hypothermia, Dr. Phyllis Knocker, of the Witwatersrand Medical School, Johannesburg, Union of South Africa, has shown that histopathological changes do occur in the vital organs of animals subjected to this procedure (*Lancet* **2**:837, 1955). Dogs were anesthetized, and, after laparotomy, biopsy specimens were taken of the liver, kidney, and adrenals. Hypothermia was induced by cooling the dogs with ice and was maintained up to two and a half hours, after which further biopsy specimens were taken. Histopathological changes were seen in the organs examined, even when the animals were not cooled beyond the point generally regarded as ideal for operation. The liver cells showed coarse fatty droplets, poor nuclear staining, loss of glycogen, and congestion of the blood sinusoids. The sudanophil substances in the adrenal cortex were increased and vacuolation occurred in the reticular zone. In the kidney the cells of the lower nephron were full of fat. The accumulation of fat in these organs, which was the chief finding, was attributed to anoxia. Similar changes were found when dogs were submitted to anoxia, using nitrous oxide. In view of these findings Dr. Knocker thinks that hypothermia, far from protecting the patient against operative stress, may actually increase the danger, and she questions the value of hypothermia during operation, even in selected cases.

Body Weight and Marital Status.—Lowe and Gibson (*Brit. M. J.* **2**:1006, 1955) examined the medical records for the last 10 years of 1,685 men and 5,081 women in the age group 20 to 59 employed by two large firms in Birmingham. The information available included weight, height, sex, age, marital status, and, in the case of women, size of family. The weight of the women increased throughout the reproductive period; there was no "middle-aged spread" as popularly supposed. The mean weight of the women increased regularly by about 3 lb. (1.3 kg.) every five years. The weight of the men, who were factory workers

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and not a true cross section of the population, showed little increase in weight with age. The average weight of the men at age 20 was 149 lb. (67.6 kg.) and, if anything, was slightly less than this at age 65. Comparison with figures compiled earlier in the century suggests that the increase in weight of men formerly stated to occur with age no longer occurred. In each five year age group, married women weighed more than single women, and at corresponding ages married women with children were a little heavier than married women without children. It was concluded that the effect of childbearing was not the sole or even the most important reason for the difference in weight between single and married women.

Dr. Schweitzer Honored.—Dr. Albert Schweitzer, the medical missionary, musician, and philosopher, came to London in October to receive from the Queen the insignia of honorary membership of the Order of Merit. The only other living honorary member is President Eisenhower. After the Harveian Lecture on St. Luke's Day, Dr. Schweitzer was received by Sir Russell Brain, the president of the Royal College of Physicians. Dr. Schweitzer was also made an honorary fellow of the Royal Society of Medicine and of the Royal Society of Tropical Medicine and Hygiene. An honorary doctorate of laws was also conferred on him by the University of Cambridge. During his stay Dr. Schweitzer was the guest of Prime Minister Eden.

Abortion Law.—At the meeting in London in October, the Magistrates Association voted 189 to 148 in favor of a resolution to suggest changes in the present law on abortion. The main object was to frame a resolution to insure that no medical practitioner acting in good faith would be found guilty of an offense when terminating pregnancy to preserve the life of the mother and that therapeutic abortion might be permitted if there was a grave risk of the child's being born mentally or grossly physically defective. Technically, it is still an offense for a medical practitioner to terminate pregnancy for therapeutic reasons.

INDIA

Fluorosis Causing Paraplegia.—S. V. Rao reported (*J. Indian M. Profession* **2**:780 [Sept. 6] 1955) a case of paraplegia due to fluorosis. The patient, a 45-year-old man, was admitted to the hospital because of tingling and numbness of both lower extremities, with loss of strength of 18 months' duration. The onset was insidious. Examination revealed loss of power in his lower extremities. His gait was spastic, and he was unable to move about except with the help of a stick. The abdominal reflexes were not elicited. Knee and ankle jerks were exaggerated on both sides. Bilateral ankle clonus was elicited, and Babinski's sign was elicited bilaterally. The patient complained of urgency of micturition and constipation. His spine was rigid in the thoracolumbar region. Roentgenograms of the spine, skull, and pelvis showed areas of sclerosis and exostoses of the pelvic bones. No diagnosis was made on the first admission, and the patient went home against medical advice. About 10 months later a case of paraplegia due to fluorosis with skeletal involvement was reported at a clinical meeting. The symptoms and signs in this case and the reported case were so similar that the patient was asked to report back to the hospital with a sample of his drinking water. The paraplegia had not improved, but he was able to walk with the help of a cane and had regained sphincter control. His drinking water, from a well in his own house, contained 7.2 ppm of fluorine. The fluorine content of his urine (normally 0) and blood was 3.3 ppm and 2.4 ppm respectively. A diagnosis of fluorosis was made. The paraplegia was caused by compression of his spinal cord due to changes in the spine, and the tingling and numbness were caused by pressure on roots and nerves. Treatment in such an advanced case is usually disappointing. The addition of magnesium oxide to the drinking water and boiling to remove the fluorine are recommended. Calcium salts are given to increase the excretion of fluorine, thus decreasing skeletal damage. Vitamin C is given empirically but is probably of no value. Treatment to be effective must be continued for a long time.

Electroretinography.—Dhanda R. P. (*J. Indian M. A.* **25**:396 [Oct. 10] 1955) reported that electroretinography is an aid to the diagnosis and prognosis of diseases of the eye, as it provides an index of the functional capacity of the retina, especially in patients in whom the fundus cannot be examined directly due to opacities in the media or gross lesions in the anterior segments of the eye. It records the action potential of the retina when it is stimulated. Minimal light passing through the pupil is enough to stimulate the retina to its full activity.

NORWAY

Health of Older People.—A member of the Norwegian Old Peoples' Health Committee, Prof. Axel Ström has investigated the living conditions of 1,389 persons over the age of 70 years by means of a questionnaire. The subjects lived in 16 rural districts, 6 small towns, and in Bergen, the second largest city in Norway. The district nurses in these 23 areas were given special training for the task of visiting the homes of all these older people and inquiring about their woes and major and minor needs. It says much for the tact with which the nurses carried out this task that less than 2% of the persons questioned refused to cooperate; 79% had one or more complaints concerning their health, the women outnumbering the men in this respect in the ratio of 83 to 74%. The number of persons who had been admitted to hospital in the past year was smaller among those over than among those under 80 years of age. It is possible that in view of the shortage of beds hospitals have been reluctant to admit persons who are over 80 years of age and in need of nursing care rather than active treatment. The ailments complained of included rheumatism (31% of the men and 42% of the women). Its frequency was just as great in those under as in those over 80 years of age. Another common complaint, especially in those over 80 years of age, was giddiness of which 29% of the men and 38% of the women complained. Foot trouble was complained of by 22% of the men and 38% of the women. About 9% of the people over 70 years of age living in rural districts and 11-12% of such persons in the towns were in need of admission to an old age or nursing home.

Sport Injuries.—Dr. Otto Johansen in a survey of the records of all mishaps requiring first-aid treatment by the emergency medical service of Oslo during the period 1946-1948 found that 8% of these mishaps were the outcome of athletic events. Studying the same problem from another angle, Prof. Haakon Natvig has investigated the frequency of sickness leave traceable to sports in the staffs of two industrial concerns. He found that during a five year period 1.9% of all sickness leave could be traced to this factor and that 18.4% of the accidents leading to such leave were the outcome of some sport. The most recent of these investigations, reported in *Tidsskrift for den norske lægeforening* for Oct. 15, 1955, was undertaken by Andersen and Holen, whose material consists of 1,758 persons medically examined during the period 1949-1952. The injury rate averaged 8.9% and was higher in male than in female athletes. The sports most frequently responsible were skiing, soccer, and tennis. The most common lesions were fractures and sprains. The injury rate among men was highest in the age group 17-19 years. At this comparatively tender age, training is still often incomplete and the athletes take chances that older competitors would avoid.

National Association for Dietetics and Health.—In October, Prof. Axel Ström presided over a meeting at which Prof. Haakon Natvig outlined the conditions under which the new National Association for Dietetics and Health has come into being. The nationwide involuntary experiment in dietetics imposed on Norway during the last war yielded invaluable lessons. The remarkable decline in the mortality from certain important diseases during this war created new impulses in the field of dietetics, with

special reference to the influence of diet on the cardiovascular diseases. As from Oct. 1, Dr. Nicolay Eeg-Larsen has been secretary general and scientific director of the association. He will collect and evaluate data concerning dietetics for the benefit of physicians, dentists, and teachers of dietetics. The association will have its own publication, entitled *Dietetics and Health*, and will promote research, with regard to the special dietetic requirements of certain groups in the community, such as seamen, fishermen, and the inmates of hospitals.

National Cancer Association.—Every October special meetings are held by the Norwegian National Cancer Association, which is affiliated with all the other important voluntary bodies in the country such as the National Tuberculosis Association and the Red Cross. It promotes cancer research, the provision of hospital beds, health education, and social welfare for the victims of cancer. At its annual meeting in October, special attention was focused on the organization of a lottery, a notice of which is to be sent to every household in Norway and a plan whereby women may now undergo an annual medical examination of the breasts at a charge of 2 *kroner* each time. The object of such an examination is the discovery of any abnormality, not just a fully developed cancer of the breast. The abnormalities found will be dealt with according to the special needs of each patient. It is believed that these examinations are more likely to relieve women's minds than to create any cancerophobia.

PERU

Symposium on Schizophrenia.—At the second Peruvian Journeys on Neuropsychiatry in September, Dr. Juan Francisco Valega, director of the Víctor Larco Herrera Hospital for Mental Diseases of Lima, said that during the 1940's the admission rate for schizophrenia increased steadily year after year, while that for manic-depressive psychosis and general paresis remained unchanged. Statistical data since 1950 are not reliable because admissions for mental diseases had to be greatly curtailed for lack of bed space. Dr. Alfredo Saavedra, associate professor of psychiatry, described a new type of schizophrenia, the endoreactive form in which (1) a severe emotional stress is always a precipitating factor; (2) there are basic changes of the mental states and of the mood; (3) irritability, aggressiveness, isolation, and psychological reactions disproportionate to the provocation are frequent (all these features constitute the so-called dysthymias and do not disturb the consciousness); (4) there is inversion of the affect, unconventional behavior, sudden changes in the behavior pattern, phenomena of depersonalization, increase of the sexual appetite, and loss of ethical and moral values; (5) there are marked autonomic reactions, especially the flushing associated with dysthymia; (6) there is negligible intellectual deterioration (most of the patients are intellectually bright); (7) the patients generally rebel against any type of therapy; and (8) except for the changes in the states of mind, all mental symptoms are episodic in nature, alternating with periods of apparent normality. Dr. Saavedra has observed this type of psychosis in more than 15 patients. He also described patients with atypical schizophrenia; the pseudoneurotic form with an onset that closely resembles hysteria or hypochondria; the form associated with endocrine disturbances of the menses; and forms that in their onset simulate manic-depressive or an epileptic psychosis.

Dr. Mariano Querol stated that insulin, electroshock, relaxing drugs, surgery, ventricular lavage, and psychotherapy, systematically and properly used, will produce fair to excellent results in every schizophrenic patient, the results depending more on the individual patient than on the type of therapy used. There is, however, no etiological treatment for the condition, and the patients who are improved or even apparently cured cannot be considered definitely cured. Chlorpromazine and reserpine are especially useful in the symptomatic therapy of the psychoses, particularly in the control of the anxiety states and in the supportive management of chronic cases. Besides, they greatly facilitate the psychotherapeutic approach to the patient. Dr. Querol and Dr. Horacio Estrabidis reported on clinicoelectroencephalographic correlations in schizophrenia. They studied 15 schizophrenic patients, two of whom also had epilepsy. All had been sick for more than two years and were chosen to undergo electroencephalographic study to reveal possible focal cerebral damage. Thirteen patients showed slight to severe abnormalities in their tracings. They were focal in four and generalized in nine. In only two of the five patients with tracings suggestive of idiopathic epilepsy had the epilepsy been diagnosed. All patients with psychomotor changes, ranging from akinetic to hyperkinetic, showed abnormal frontal lobe tracings, but the pattern varied from patient to patient. Failure to obtain clinical improvement was the rule in all patients whose tracings showed generalized abnormalities, and a follow-up examination of these patients revealed deterioration. On the other hand, of the five patients with focal abnormalities, two made a social recovery. The condition of the two patients with normal electroencephalograms deteriorated.

Dr. Carrillo Broatch reported on the therapeutic results in 250 schizophrenic patients, aged 23 to 79 years, who had suffered from the disease for 5 to 15 years. The treatments used were: (1) electroshock plus ventricular lavage; (2) insulin plus ventricular lavage; (3) electroshock plus insulin, antihistaminics and Cardiazol, anticonvulsant drugs, chlorpromazine, reserpine, corticotropin, or supporting therapy; (4) insulin plus chlorpromazine; (5) chlorpromazine plus Phenergan and phenobarbital; and (6) leukotomy plus ventricular lavage. In order to evaluate the usefulness of ventricular lavage, the author used it in combination with either electroshock or insulin in the management of 110 of their patients. It was performed soon after the electroshock therapy was applied or during the hypoglycemic coma. As soon as the procedure was finished analgesics intramuscularly and antibiotics, in doses depending on the grade of meningeal reaction obtained, were given. The body temperature, pulse rate, and respirations were carefully watched. No grave or fatal complications were observed. Every patient underwent the lavage once or twice a week, receiving 10 to 25 such treatments. Follow-up of all the patients of both groups extended from three to five years except in 20, who were followed for five months. In the group treated with ventricular lavage, there were 10 complete recoveries with no relapses and 22 social remissions. Patients with the catatonic form of the disease were most benefited by this treatment. The results in the other group comprising 140 patients were disappointing—only 6 completely recovered and 19 social remissions were obtained. No one treatment appeared to be better than the others. In this series 22.8% of the patients were benefited by treatment and 77.2% were not. The author concluded that ventricular lavage may be helpful in the management of chronic schizophrenia and should be tried in patients who have not been helped by other procedures.

Symposium on Apoplexy.—At the same meeting it was stated that, besides simple roentgenography, arteriography with iodopyracet was helpful in the diagnosis of the cause of cerebrovascular accidents. According to several speakers the hazards from its use are minimal if the contrast medium is used in quantities of 20 to 40 cc. Likewise, pneumoventriculography, when properly used in certain patients, is a useful measure. Dr. Susy Roedembeck said that authorities do not agree as to the cause of cerebral hemorrhage. She believes that every stroke results from a combination of several cerebral and extracerebral factors, which vary in different patients, so that no generalization can be made. Dr. J. O. Trelles said that he has often found histological evidence that cerebral hemorrhages, clinically regarded as being caused by arterial damage, are instead caused by rupture of a varix, phlebothrombosis, and thrombophlebitis.

Dr. Gino Costa stated that in the emergency management of apoplexy the physician should: (1) see that the patient's position is frequently changed to minimize the development of decubitus ulcers and pulmonary hypostasis, taking care also to prevent postural deformities of the paralyzed extremities; (2) improve the cardiovascular state of the patient by means of cardiac stimulants and coronary vasodilators if indicated; (3) insure adequate pulmonary ventilation and if necessary remove bronchial secretions at short intervals with a bronchial aspirator; perform a tracheotomy or give oxygen and carbon dioxide inhalations; (4) have the patient fed through a tube; (5) insure colon and

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bladder function by the use of enemas and catheterization if necessary; (6) keep the patient at rest, using chlorpromazine as the drug of choice; (7) give broad-spectrum antibiotics in large doses; and (8) avoid aminophylline, because recent studies indicate that it diminishes the cerebral blood flow. Since nicotinic acid and amyl nitrite cannot be shown to modify the cerebral blood flow, they too should be avoided. When thrombosis is found to be the cause of the stroke, expectant treatment is preferred in most cases. The use of substances that increase the cerebral blood flow is necessary, and 5% carbon dioxide with oxygen must be given. Papaverine and Hydergine can also be given for this purpose. The blood pressure should be normalized, but this must be done gradually. If diabetes or syphilis are causative factors, specific therapy is essential.

In cerebral vascular accidents caused by embolism, anticoagulant drugs are indicated if the services of a laboratory are available, otherwise it is better not to prescribe them. If used, bishydroxycoumarin and ethyl biscoumacetate are preferred. This therapy should be continued as long as the chance of new emboli persists. If hemorrhage is the underlying cause, anticoagulants and rutin are given; 40 cc. of 1% procaine in 500 cc. of isotonic glucose solution (or isotonic sodium chloride solution if the patient is diabetic), with an ampul of Phenergan, may be given by intravenous drip over a period of eight hours. If necessary, this can be repeated daily for several days. Mercurial diuretics are given to prevent cerebral edema. Surgery may be necessary, and a surgeon should be available on short notice. The blood pressure, usually greatly elevated in these patients, must be controlled. Carbon dioxide inhalations are also indicated. In the patient who survives the accident and remains incapacitated, rehabilitation is as important as the emergency therapy. The goals of the rehabilitation program are: (1) to prevent the development of deformities or to treat them if they have already developed; (2) to train the patient to walk again; (3) to teach him to perform the usual activities of daily life and to use the sound hand in simple tasks, trying in the meanwhile to develop the use of the affected hand; and (4) to treat the facial palsy and any existing speech disturbances. Although physicians disagree as to the usefulness of stellate ganglion block, it is helpful in the management of certain cerebrovascular accidents if it is performed within six hours after the onset. When thrombosis is the cause of the stroke, cortisone may be useful.

Dr. E. D. Rocca said that he has used artificial hibernation with encouraging results to control the shock caused by the accident. Dr. J. V. Beranles said that in a series of 134 patients who had suffered from cerebral vascular accidents, the following clinical types were recognized: (1) typical apoplexy characterized by sudden and prolonged loss of consciousness; (2) aggravation apoplexy characterized by a progressive loss of consciousness and a deteriorating general state; (3) cerebromeningeal apoplexy characterized by symptoms of severe meningeal irritation but without loss of consciousness; (4) simple paralytic apoplexy due to involvement of the cerebellum or cerebral trunk characterized by varying paralytic patterns depending on the location of the lesion; and (5) mild and poorly defined forms of apoplexy characterized by transient, mild symptoms and a good prognosis. In his series, 48 patients suffered from typical apoplexy of which 25 died, 13 recovered, and 10 remained invalids; the cause was hemorrhage in 42, thrombosis in 5, and embolism in one. Seventy-one patients had the simple paralytic form of which 53 recovered and 18 remained invalid; the cause was thrombosis in 58, hemorrhage in 6, circulatory disturbances in 6, and embolism in one. All the six patients with mild or poorly defined apoplexy recovered, and vascular lesions other than hemorrhage were found to account for the strokes. Five patients had the cerebromeningeal form, and in all of them hemorrhage was found to be the cause; one died, three recovered, and one remained incapacitated. In four patients the aggravation type of which three died and one recovered was found; hemorrhage and thrombosis were the causes. Only 20 strokes occurred in patients under 39 years of age. The underlying cause of the accidents was embolism in 2, aneurysm in 4, infection in 14, degenerative vascular disease in 43, cardiovascular disease in 45, and undetermined in 26.

SWITZERLAND

Army Medical Corps.—Over a four year period a complete reorganization of the Army Medical Service has been conducted by Brig. Col. H. Meuli, chief physician of the Swiss Army. Simulating wartime conditions, he has decentralized the deposition of military equipment. More effective use has been made of motor transportation without, however, neglecting the transportation of the ill and wounded by railroad. Special railroad cars have been designed for this purpose. In the mountains it is still necessary to use horses and mules for transport. A new department of defense against atomic, bacteriological, and chemical weapons has been created. For purposes of study of the new organization, data were submitted by two Medical Corps training schools and a number of medical "refresher" camps (all Swiss military trainees must take a three week refresher course every year after completion of their initial training). To provide these data, a review was made of the entire Medical Corps in action, from the front-line posts to the medical establishments farthest from the front. Medical trains, special boats, and helicopters were used on this occasion. A blood transfusion service and a psychological department have been developed.

In Switzerland a physician must serve his regular military training as a citizen, after which he goes to noncommissioned officers' school in order to gain the rank of corporal and then to officers' school to become a lieutenant. To give him wider training and teach him what physical efforts are required of all soldiers, a 15 day course has been set up at the Federal School of Sports in Macolin, to be given before the officer training program. An aeromedical service is being developed at Dübendorf. One of its projects is a study of telerecording of electroencephalograms of stunt pilots.

The problem of tuberculosis in soldiers is being studied. There are factors inherent in military groups that favor the development of the disease, but on the other hand the high degree of organization of the military system facilitates the continuous practice of control measures. In the course of one training year, 244 cases of tuberculosis were discovered among the recruits. Fifteen per cent of these cases were discovered at the first physical examination, 46% through the serial roentgenograms taken at the beginning of school, 3% as the result of a tuberculin test, 11% during the course of training, 19% through serial roentgenograms taken after basic training, 5% by change in the tuberculin reaction after basic training, and 1% after military service was completed. On entering the training program, 46 to 52% of the recruits had a positive tuberculin reaction. At the end of training, 3 to 6% of these had a changed reaction and 0.05% of these developed active tuberculosis. More than a third of those whose reaction had changed showed the sequelae of a tuberculosis dating from before service. The cost of the roentgenographic examinations performed in the Army is $60,000 annually. These statistics should intensify the campaign of vaccination.

Poliomyelitis is also a problem in the Swiss Army. In the last seven years, there was a yearly average of eight or nine cases, with zero to two deaths. These figures are low in view of the fact that each year from 275,000 to 450,000 soldiers serve from 8,000,000 to 10,500,000 days. The Swiss Army is made up of militias and is not a professional army. It cannot therefore develop its military medicine as do armies in countries that have military hospitals and a professional medical corps.

Increased Resistance of Leukocytes Due to Stilbene.—Storti and Pederzini were the first to study resistance on the part of leukocytes, although many had considered erythrocyte resistance. These workers noted that leukocyte resistance is greatly increased toward the end of pregnancy and falls to normal levels about a month after delivery. The number of leukocytes increases during pregnancy to reach its maximum in the ninth month, just when resistance also attains its maximum. The authors described experiments (*Schweiz. med. Wchnschr.* **85:**949, 1955) proving that this phenomenon is largely due to the elevated estrogen levels of late pregnancy. The leukopenia caused by antimitotic agents may be due to leukocyte resistance. Experimental and clinical administration of stilbene, a synthetic estrogen, allowed continuance of antimitotic therapy longer than was thought possible without the association of estrogen, even in the presence of severe leukopenia.

CORRESPONDENCE

VACCINATION FOR TRAVELERS

To the Editor:—As a local health officer I appreciated the editorial "International Certificates of Vaccination" in THE JOURNAL, Oct. 29, page 852. I am sorry that making the point about smallpox precluded the chance of mentioning the fact that other immunizing procedures are also recorded on this form and suggesting that a physician executing this form has a responsibility to his patient as well as to expediting the federal smallpox control program. Day after day people apply to us for certification and we discover their physician did not discuss (or even discouraged consideration of) typhoid and paratyphoid immunization. Travelers to northwestern South America are advised to ignore yellow fever prophylaxis because it is not required. A physician confronted with these certificates should consider the immunization needs of his patient and not the requirements enunciated by some federal, insular, or territorial health department. Here are almost half a million chances a year for physicians to demonstrate their concern for the health needs of the patient rather than allowing themselves to be identified in their patients' minds as persons carrying out arbitrary dictates of some governmental agency. I would like to suggest that physicians be made acquainted with the mechanism for the U. S. Public Health Service collection of intelligence pertaining to international health hazards, also that the physician become acquainted with the "recommendations" columns of the booklet "Immunization Information for International Travel" (Publication no. 384, Division of Foreign Quarantine of the Bureau of Medical Services, United States Public Health Service).

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STERILITY OF LAUNDERED FABRICS

To the Editor:—In a recent article by Watson, Wilson, and Tuuri (Diaper Care in Nurseries, *J. A. M. A.* **155:**1579 [Aug. 28] 1954), the results of tests employing home-washing equipment in a utility area adjoining a hospital nursery were given. The conclusion drawn as a result of that work was that sterility resulted about 80% of the time when diapers were laundered in home-washing equipment by nursery personnel. Those familiar with laundering techniques and the sterilization characteristics relating to the laundry process will recognize that such a level of reduction of total count of micro-organisms associated with soiled textiles is totally inadequate. Watson, Wilson, and Tuuri state that a considerable saving of time of nursing and auxiliary forces is effectuated, in terms of reduced time of diaper handling and inventory record keeping, through the installation and utilization of home-washing equipment directly in the ward, thereby obviating the need for the hospital laundry for this duty or for the professional diaper service. Certainly recommendations purporting sweeping changes involving the health and safety of infants, not to mention the greater factor of contagion in general in hospitals, need to be based on complete and exhaustive evaluation of the bacteriological aspects of all phases of the laundering process. It is our opinion that nothing would be gained by adoption of any procedure involving the use of home-washing equipment by personnel in the hospital nursery who are not versed in the fundamentals of the detergent processes that obtain. The use of 1.5 oz. of powdered laundry soap, which is the normal capacity of home-washing equipment and which is deemed adequate by Watson and co-workers, hardly would be expected to produce the results obtained by professional diaper services using more than twice this quantity of soap and alkaline scouring agents and softened water under carefully controlled conditions. These investigators seemingly have overlooked completely the sterilizing aspect of chlorine bleach, laundry sour, and germicides, which have been in use in professional diaper services for years. Workers in the field of detergency research long have recognized the marked superiority of commercial laundering procedures over home washing in terms of such performance characteristics as soil removal, whiteness retention, and stain removal. These latter factors are, however, quite apart from the fundamental principles under discussion. The bacteriological cleanliness of the laundered fabrics is of prime consideration in this instance; indeed, arguments relating to economy or convenience are not pertinent to the case in point. Studies in the critical evaluation of the bacteriological efficiency of the laundering process have been made by Oesterling and associates (Sterilization in the Power Laundry, *Pennsylvania State Univ. Bull.* **37:**1, 1943) and by one of us (Sherrill, J. C.: A Quantitative Chemical Method for the Assessment of Bacteriostasis in Textile Fabrics Soiled with Nitrogenous Matter, Thesis, Pennsylvania State University, 1952). These studies have delineated the role of various aspects of the washing process on the sterility of the laundered fabric. It is not the purpose of this writing to present new evidence but rather to cite the studies aforementioned. It is believed that a review of these studies is pertinent, since considerable difference in the bactericidal efficiencies of home and professional laundering procedures does exist in fact and since little apparently is known of this disparity.

TABLE 1.—*Reduction in Total Bacterial Count Utilizing Typical Home and Commercial Laundry Procedures*

Laundering Method	Total Counts, per Cu. Cm. Initial	Total Counts, per Cu. Cm. Final	% Decrease in Count
Home-Washing Method			
Home washing equipment; one sudsing, three rinses; 120 F; powdered laundry detergent	220,000	19,000	91.4
Commercial Washing Methods			
Commercial washing equipment; three sudsings, five rinses; 160 F; built soap *	68,000	3,000	95.5
Commercial washing equipment; three sudsings, five rinses; 160 F; built soap, and sodium hypochlorite bleach	195,000	2,500	98.7
Commercial washing equipment; three sudsings, five rinses; 160 F; built soap, sodium hypochlorite bleach, and sour † final rinse	195,000	600	99.7
Commercial washing equipment; three sudsings, five rinses; 160 F; built soap, sodium hypochlorite bleach, and sterilizing sour final rinse	432,000	400	99.9

* Built soap refers to a blend of soap and alkali or alkaline salts. The latter compounds are added to enhance the scouring power of soap in the laundering process.

† Sour refers to a mild acid salt used to neutralize the last traces of alkali not removed by dilution in rinsing.

Proper handling of soiled diapers involves: (1) methods for minimizing growth of micro-organisms and development of odors during storage prior to laundering and (2) laundering methods capable of producing a sterile finished product. These requirements constitute a bacteriological problem of considerable magnitude. The work of Oesterling and associates has thrown considerable light on the sterilizing effect of stages and combinations of stages of professional laundry operations. Studies carried out by the American Institute of Laundering (Technical Report No. 394, 1950) have demonstrated the efficacy of the home washer in the sterilization of fabrics being laundered. Their methods of test are cited briefly. Specimens to be examined were collected in sterile quart jars and reserved in ice pack for examination. A 1.5% nutrient agar was seeded with 1 ml. portions of each sample and maintained at 37 C for 24 hours. Counts then were made using a colony counter in the usual manner. In one series of tests, counts were made of (1) tap water entering the plant, (2) water in equilibrium with the soiled fabrics prior to the start of the laundering process, and (3) water from which the laundered fabrics were removed. Table 1 illustrates the data obtained in the studies previously cited in the assessment of bactericidal power of professional and home-washing processes on ordinary assortments of soiled linens

being laundered. Table 1 shows the degree to which sterilization has been accomplished in the home-washing process and in professional laundering processes of varying character. Note that where built soap, sodium hypochlorite bleach, and sterilizing sour have been used, nearly complete (99.9%) reduction in total bacteria counts has been effectuated, as compared to only 91.4% reduction in the home-washing procedure. These studies have been made under controlled conditions, wherein all phases of the washing process were under careful surveillance. The reduction in total bacteria counts achieved under actual operating conditions in typical professional laundry plants wherein special precautions are not taken with details of the washing procedure are shown in table 2. The washing procedures in these instances are not identical in detail in every case, but follow generally the procedure indicated in the last method of table 1, which is optimum. These data are from the work of Oesterling and co-workers. Total bacteria counts were made as described previously. In every case total counts were reduced below levels of total count prevailing in tap water. These data represent a cross section of widely varying locale and operating conditions, all of which come within the meaning of professional laundry practice.

TABLE 2.—*Sterility Achieved in Laundered Textile Fabrics Under Typical Operating Conditions*

Plant No.	Raw Supply (Tap Water)	Total Counts, per Cu. Cm.		% Decrease in Count
		Initial	Final	
1	16	14,500,000	0	100.0
2	23	8,000	4	99.9
3	6	931,000	3	99.9
4	11	13,700,000	8	99.9
5	38	9,250	8	99.9

Experimental evidence is available concerning the sterilizing effect of various steps in professional and home laundry practice against the pathogens Micrococcus (Staphylococcus) aureus, Salmonella (Eberthella) typhosa, and Clostridium welchii. In these tests sections of sterile white cotton sheeting were inoculated with these organisms, and, following a suitable growth period under controlled conditions, the fabrics were subjected to detergency treatments shown in table 3. The percentage decrease in numbers in each organism was determined by a comparison of the total counts of clear water extractions of test specimens prior to treatment and of water taken from the final bath at completion of each treatment. These data are also from the work of Oesterling and co-workers. It may be noted from table 3 that all phases of the professional laundry process are nearly completely effective in terms of sterilization of contaminated fabrics. The same is obviously not the case for the home-washing process. We wish to emphasize that while sterility may be achievable through the use of home-washing equipment, many factors are operating that tend to reduce the bacteriological efficiency of the home-washing process. Such requirements as adequate hot water supply at a temperature of 180 F, properly blended soap and alkali, chlorine bleach, and laundry sour frequently are not available in the hospital nursery. Optimum results in the laundering of soiled textile fabrics require a washing cycle comprising three or four soaping operations, followed by a minimum of four to six deep rinses. Professional laundry practice involves utilization under controlled conditions of all of these factors, many of which are completely impractical in home-washing procedures. All of these factors need to be considered carefully in light of the evidence presented before any precedent involving home washing in hospital nurseries is established.

TABLE 3.—*Sterilizing Effect of Components of Home and Professional Laundry Procedures on Three Pathogens*

Component of Laundry Procedure	% Decrease		
	Micrococcus (Staphylococcus) Aureus	Salmonella (Eberthella) Typhosa	Clostridium Welchii
Home Washing Procedures			
Water at 120 F	61.3	75.9	20.0
Water and powdered laundry detergent at 120 F	99.5	75.0	96.4
Commercial Washing Procedures			
Water at 160 F	99.9	99.9	100.0
Water and built soap at 160 F	100.0	100.0	100.0
Sodium hypochlorite bleach at 160 F (diluted)	100.0	100.0	100.0
Sterilizing sour at 120 F (diluted)	97.8	100.0	68.0

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COLOR

To the Editor:—A relatively narrow range of color tones, apparently not exceeding 12 to 14 tints, comprise the colors that create the most congruous or generally beneficial backgrounds in rooms or space, and there is nothing mysterious about them any more than nature is mysterious. They simply are comprised in the median range of the spectrum colors, and the more irritating color tones are not overprevalent in them. These colors also appear as the most popular color tones when average and normally healthy individuals have a choice of selection. These dozen or so tints may be flanked with some 14 to 16 additional color tones in a secondary preferential color range, as seen in the color harmony scale. As one moves from these tints one goes increasingly into what may be called exotic or "cloudy day" or like effects. These so-called exotic tints, although often attention evoking, tend to cause subtle effects or moods that normally healthy individuals instinctively try to avoid. Sex, age, and varying degrees of nervous degeneration—and, to some degree, racial origin—tend to cause variation in the reactions of different individuals to color. Often these variations are quite marked. Combinations of such types of individuals as patients in health care facilities are common. A certain percentage of people, of course, do not have normal color perception, and variations from the normal in the reactions of these individuals to identical colors may account for some of the varying color preferences expressed by different persons. The several types of color blind persons, and some of the primitive peoples who cannot distinguish all the visible spectrum colors, may be expected to express interest in those colors that they can distinguish. Color variation also results when objects are viewed under such lighting as daylight, ordinary incandescent, and fluorescent light. Incandescent light approximates sunlight closely, and no surface can show color that is not in the light rays that fall upon it. The effects of color on people are subtle and continuous. What colors will blend well? The answer depends on several factors. Usually buildings are so oriented that various rooms have different exposures to sunlight. Rooms that face the angle of the sun's rays gain a sense of shade and coolness by adding small portions of tinting color as umber, burnt sienna, or ochre to the sunny shades of background color, which usually is done by the paint manufacturer of standard paint in tints. But paint in tints with similar names, made by different manufacturers, may vary considerably in color. Sunlight effect is enhanced in rooms poor in sunlight by using color tones in which yellow, toned down with white, is present to impart an effect of warm sunlight. Where special conditions need not be met, it is usually best if shading is translucent, in soft brownish-yellows, and near opaque shades are avoided. Of course, there are several ways to control excess daylight or sky glare in rooms with light-colored pastel backgrounds by using shades, translucent curtains, or venetian blinds. Window shades, drapes, and other objects in rooms may be chosen to add color interest as well as to serve practical needs. The objective, of course, is to create a pleasing environment that will cause one to feel comfortable. Incongruous environmental color tends to produce ill-effects in individuals to an extent of causing an unhappy mood or an ill-at-ease or depressed feeling. It may cause eye strain and thus fatigue and may influence mood and will. A basic need in the creating of matter-

of-fact color environments in buildings is to have technicians who are well trained in the theory of color and harmony and can cope with the practical needs where the work is to be done. This problem does not always have at hand a perfect solution. The preparation of beneficial color environments is a practical endeavor that calls for sound judgment. It is less a matter of learning something "new" than to understand and utilize what always was good. Those who create color environments exercise a mass influence on the well-being of people.

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WHOLE BLOOD TRANSFUSIONS

To the Editor:—In THE JOURNAL, Sept. 17, 1955, page 171, Krevans and Jackson described a "Hemorrhagic Disorder Following Massive Whole Blood Transfusions" associated with a fall in platelet level. It is well known that simple reduction of circulating platelets is not enough to produce hemorrhage. Other factors are involved, especially those that injure capillary walls. It is my feeling that one such factor is time alteration of bank blood. Most banks allow blood to be used within 21 days. During this time, even under the best conditions of storage, many leukocytes, erythrocytes, and platelets die and become not only useless but probably toxic in effect. Also, as time goes on, the multiplication of psychrophilic micro-organisms increases the toxic effect of certain units of stored blood. Small as each of these factors may be in one pint, their cumulative effect can be dangerous in massive transfusions. Then, the combination of platelet reduction from the large rapid infusion and capillary injury from the toxic substances produces abnormal bleeding. My practice is to limit the use of bank blood to 14 days. Even after massive transfusions I have not encountered abnormal or otherwise unexplained hemorrhage. It would be helpful to know whether the authors have evaluated this storage time factor of transfused blood and whether they have followed the suggestion in THE JOURNAL, July 2, 1955, pages 801 and 802, that 10 cc. of 10% calcium gluconate be given intravenously after each liter of blood in order to counter the effect of large amounts of citrate.

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ESOPHAGEAL VARICES

To the Editor:—I should like to comment on a statement made in an editorial entitled "Esophageal Varices," which appeared in THE JOURNAL, Oct. 1, 1955, page 484. In discussing the control of esophageal bleeding with the balloon tamponade procedure, it was pointed out that Linton and Warren state that this procedure is "useful in differentiating the source of bleeding, since, if the cardioesophageal tamponade controls the bleeding, then the source of it is esophageal varices and not a peptic ulcer of the stomach or duodenum." Some years ago I published a letter and the photographs of the first case of esophageal bleeding controlled by balloon tamponade reported in this country at the Pennsylvania Hospital (*J. A. M. A.* **138**:908 [Nov. 20] 1948). I referred to some work that had been done on the balloon tamponade. Two of the first six patients who were treated with balloon tamponade for presumed esophageal bleeding later were shown to have active gastric ulcers. The bleeding, presumably from the active ulcers, stopped as completely as had bleeding from esophageal varices when the tamponade tube was used. In all these patients a three lumen tube was used. One lumen was used for gastric suction, the second lumen anchored a mushroom balloon in the cardia of the stomach, and the third balloon provided the esophageal tamponade. By maintaining suction within the stomach I feel that this organ was able to collapse, shrink, and telescope upon itself toward the mushroom balloon in the cardia. This is the only mechanism by which I can explain the cessation of bleeding from these gastric ulcers. I have had the opportunity to see two other patients with gastric ulcers, in one of whom we used the mushroom balloon with gastric suction purposefully to attempt stopping the gastric ulcer bleeding. In this instance we were successful. In the other instance again a bleeding gastric ulcer was presumed to be bleeding esophageal varices, yet the same result was obtained. For this reason I do not feel that the balloon tamponade is always useful in differentiating bleeding of esophageal varices from that of a gastric ulcer.

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COBALT ADMINISTRATION AND THYROID ACTIVITY

To the Editor:—As stated in an editorial in THE JOURNAL, Aug. 13, page 1371, a difference of opinion has arisen with regard to the effect of therapeutic doses of cobaltous chloride upon thyroid function. I have recently been privileged to observe 10 members of an Italian family, 6 of whom have the hereditary leptocytosis trait to a greater or lesser degree. Each of these patients was given cobaltous chloride in dosages ranging from 25 to 100 mg. per day in the case of two children, aged 5 and 11; and 25 to 125 mg. per day in the instance of three adults, aged 26, 28, and 54. Experimental supplies of cobaltous chloride, furnished in 25-mg. enseals, were used during this study. Gastric irritation accompanied by vomiting was exceedingly common. In every instance, the anemia was improved during the period of cobalt administration. Iron was not given concomitantly. In several patients there was laboratory evidence of thyroid hypofunction. All of the family could not be assembled for physical examination. The subjects showed the following changes prior to and at the end of therapy, which extended from Jan. 25, 1954, to April 27, 1954.

Changes in Patients Given Cobaltous Chloride

Case No.	Age	Sex	Time of Measurement	Hemoglobin Level, Gm. per 100 Cc.	Protein-Bound Iodine, Mcg. per 100 Cc.	Total Cholesterol, Mg. per 100 Cc.	Cobalt, Mg. per 100 Cc.
1	26	F	Before treatment	8.3	4.6	182	0
			After treatment	11.3	3.6	191	40
			2 mo. after treatment	10.7	6.4	169	Tr.*
			3 mo. after treatment	9.1	6.2	230	0
2	11	M	Before treatment	10.8	5.4	...	0
			After treatment	12.2	1.8	241	Tr.
			2 mo. after treatment	12.4	6.2	209	0
			3 mo. after treatment	9.4	5.4	225	0
3	54	F	Before treatment	10.2	5.4	228	0
			After treatment	11.3	6.2	198	0
			2 mo. after treatment	11.0	6.2	183	0
			3 mo. after treatment	9.7	5.8	235	0

* Tr. = trace.

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FILTERS FOR RADIATION

To the Editor:—The readers of Dr. Kirsh's valuable article on "Radiation Dangers in Diagnostic Radiology" (*J. A. M. A.* **158:** 1420-1423 [Aug. 20] 1955) may arrive at the conclusion that the use of a filter can reduce the potential genetic damage caused by diagnostic roentgen studies (if such exists). It is of the utmost importance to point out that this is unfortunately not the case. Radiation can produce genetic changes only when it reaches the testes, ovaries, and perhaps the uterus of a pregnant woman. The filter recommended absorbs mainly the superficial component of the x-rays and—in oversimplification—substitutes for the patient's skin. A filter as described in the article reduces thus the

x-ray dose to the first few millimeters of the patient's tissues but not to organs located at a greater depth. Though there might be a slight reduction of the dose to the most peripheral regions of the testes, there is certainly none elsewhere in the testes or anywhere in the ovaries when an aluminum filter of 1 to 3 mm. thickness is used. Employment of significantly heavier filters does not help either because adequate blackening of the radiographic film can then only be obtained if one increases the exposures. This cancels any beneficial effect of additional filtration. This statement does not detract from the general value of filters in reducing skin exposure and, indeed, here at this institution almost all diagnostic x-ray machines are equipped with a copper filter of 0.1 mm. thickness for this reason, whereas the fluoroscopes possess an aluminum filter of 3.0 mm. thickness, which serves the same purpose.

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BUSINESS PRACTICE

The American Medical Association and the Sears-Roebuck Foundation cooperatively have prepared a brochure entitled "A Planning Guide for Establishing Medical Practice Units." This publication contains practical suggestions on various phases of planning from selection of a site to arrangement of equipment and is available in the libraries of state and county medical society offices. From time to time parts of the brochure, slightly modified editorially, will be reproduced in the Business Practice section of THE JOURNAL.—ED.

WHERE TO LOCATE A MEDICAL UNIT

Having selected the city, town, or small community in which you wish to locate, your first project is to look over the area carefully before selecting a site for your medical practice unit. The central business district, a residential shopping area, a new development, or perhaps a suburb are all possibilities. The selection depends upon your preferences and the type of your practice. A reliable realtor can advise about availability and values of building sites, buildings that can be bought and remodeled, and rental space that can be leased and improved.

If you have picked an area predominantly residential, it would be well to check with the local zoning commission, if one exists, or with the city council to find out whether your medical facility will be permitted. Learn the trends of the city. Avoid an area that will deteriorate or change character in the foreseeable future. If there are no zoning regulations, consider the reactions of your neighbors. Their attitudes can influence early success.

A hospital is generally an important adjunct to a physician's practice. Therefore, the following questions are among those you should ask yourself: Will patients receive better care if the hospital, with its additional diagnostic facilities, is close by? Will patients generally be sent to one hospital or will they be sent to several? Will your travel time between office and hospital be increased unreasonably? If no hospital is accessible would you have to provide emergency facilities?

Your medical facility should be easy for patients to find. It should be located near main arteries of traffic and preferably within a convenient distance to public transportation. Perhaps the ideal location would be a short distance from a main traffic artery, where the building housing your unit can be seen but still be far enough away that noise and traffic is not a problem.

No matter where the medical practice unit is to be located, make sure that the sewer, water supply, electric service, telephone service, and gas service are adequate. In the center of town these questions are largely academic, but they are of prime importance to a location at the edge of an urban area, in a small community, or in an old residence. Keep in mind the fact that if you are too far from any of these services the extension and connection costs can be excessive. Noise from industrial establishments and switch yards, fly and mosquito breeding grounds, and smoke and unsightly surroundings can have an important bearing on the success of your practice unit. Not only the present conditions but also the possible future development should be considered.

MEDICAL FILM REVIEWS

BCG Vaccination Against Tuberculosis: 16 mm., color, sound, showing time 19 minutes. Produced in 1954 by Olympus Productions, Cincinnati, for the American Trudeau Society of the National Tuberculosis Association and the Research Foundation. Procurable on loan or purchase ($147.50) from Research Foundation, 70 W. Hubbard St., Chicago 10.

This film tells of a young doctor who visits a senior physician to ask many questions and learn about BCG vaccination against tuberculosis. The older doctor tells the young physician that he has been using BCG at the hospital for many years and shows his visitor the actual tuberculin testing and BCG vaccination of student nurses. During this demonstration, it is shown how freeze-dried BCG is prepared for use. This vaccine is shown to be standardized and stable. The multiple puncture disk method of vaccination is demonstrated in detail, and it is shown to be simple, effective, and painless and a method that eliminates complications following vaccination. The doctor explains the approved role of BCG vaccination in a complete tuberculosis program and presents the results of carefully controlled studies in the United States as well as some of the results of BCG vaccination throughout the world. The recommendations of the American Trudeau Society for the use of BCG vaccine are presented. This film is recommended for physicians who are interested in tuberculosis control, especially those dealing specifically with the health problems of student nurses, interns, residents, or groups where exposure is greater due to the high incidence of tuberculosis in the local population.

Nurse Please: 16 mm., color, sound, showing time 28 minutes. Sponsored by the National Association for Practical Nurse Education, New York. Produced in 1954 by and procurable on rental ($4.50) or purchase ($140) from Trident Films, Inc., 510 Madison Ave., New York 22.

This is the story of a young mother who, almost by accident, becomes interested in practical nursing and finally achieves a career in this field. Jean Markel is a widow whose only child is the victim of fragilitis ossium. A talk with the director of nurses at the hospital where her son is a patient helps Jean to decide to apply for training in the hospital school of practical nursing. This film then goes on to outline the basic course and fields of study in practical nursing after her application is accepted. In addition, the many opportunities open to practical nurse graduates are reviewed. There is a little too much emphasis on the personal problems of the main character instead of on the training itself; however, this does show that the demands of everyday life need not stand in the way of a practical nursing career. It should be emphasized that the training is given by professional people and not by other practical nurses. When accompanied by appropriate written material or when introduced by someone who is familiar with the field of practical nursing, this will be a valuable film in recruitment and could be shown to women's clubs, PTA groups, and high school students.

Good Health Practices: Part II: 16 mm., color, sound, showing time 10 minutes. Produced in 1953 by and procurable on purchase ($90) from Avis Films, Inc., 904 E. Palm Ave., Burbank, Calif.

The purpose of this film is to instruct primary and elementary grade children in basic good health practices in regard to teeth, eyes, ears, nose, and posture. Judy and Jim's good health practices are portrayed in the course of a vacation day spent at the beach and at home. Before going to the beach, Judy pays a routine visit to her dentist, who confirms the results of her good dental practices. At the beach, the dependence upon mouth, eyes, ears, and nose for enjoyment of the simplest pleasures is shown. Later, at home, the children continue their good health practices while watching television, studying, eating, and going to bed.

Mistaken impressions and, at times, even incorrect ones are given. For example, blowing the nose one side at a time is recommended in the film, and the old fallacy that carrots are good for the eyes is presented. The photography is well done. The over-all ideas are good; however, the lack of medical and health consultation is evident. Even though many of the concepts may be right, the film is misleading because of this lack of consultation.

Drug Addiction: A Medical Hazard: 16 mm., color, sound, showing time 29 minutes. Prepared by Hon. H. J. Anslinger, Commissioner of Narcotics, Washington, D. C., and Dr. John C. Krantz Jr., University of Maryland School of Medicine, Baltimore. Produced in 1955 by Stark Films. Procurable on loan from Winthrop-Stearns, Inc., 1450 Broadway, New York 18.

This film begins with a lecture by Commissioner of Narcotics Harry J. Anslinger. He emphasizes the fact that narcotic drug addiction is many times more frequent in the medical and paramedical professions than in any other group. The greater part of this dramatic presentation portrays the life of a young physician who becomes an addict. The case history is taken from Mr. Anslinger's files. The signs and symptoms in the onset and course of addiction are not explained in an accepted medical frame of reference. One of the main points about drug addiction, namely, the fact that the addict generally has a psychogenic defect, is not mentioned. The film has a number of good points and carries a definite lesson; however, it should be shown to students in informal gatherings such as fraternity meetings rather than as a formal part of instruction in medical school.

Radioisotopes: Their Application to Humans as Tracer Studies and for Therapeutic Use: 16 mm., color, sound, 25 minutes. Produced in 1953 by and procurable on purchase ($335) or rental ($25) from Medical Film Guild, Ltd., 506 W. 57th St., New York 19.

This film gives a comprehensive review of up-to-date practices in the use of radioisotopes in a visually pertinent fashion. Tracer studies and therapeutic methods of application directly to the patient show the use of radioactive iodine, sodium, iron, calcium, lanthanum, strontium, cobalt, phosphorus, gold, and the neutron capture therapy involving boron for treatment of brain tumors. The film shows actual photographs of the techniques employed in administering these substances. It does not emphasize the methods used for protecting personnel. Neither does it make clear certain fundamental distinctions such as the distinction between gamma and beta radiation; however, it is a good over-all view of the subject, and the demonstration of techniques is well done. It will give the uninitiated general practitioner a graphic idea of what can be done and is being done with radioisotopes in clinical medicine.

NEW FILMS ADDED TO A. M. A. MOTION PICTURE LIBRARY

William Harvey and the Circulation of the Blood: 16 mm., black and white, silent, showing time 48 minutes. Produced in 1928 by the Royal College of Physicians, London. Procurable on loan (service charge $3) from Committee on Motion Pictures and Medical Television, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film was prepared on the occasion of the 300th anniversary of the publication of "Exercitatio Anatomica de Motu Cordis et Sanguinis." The numerous essential procedures are carried out whereby Harvey convinced himself that the blood moves through the body in a circular manner rather than by surging to and fro. The procedures illustrated involve demonstrations on dissected human material, on living animals, and in the normal human living subject. The diversity of animals used would make it expensive to duplicate these experiments as lecture demonstrations, and the careful lighting, choice of human subjects, and the closeup views afforded by the camera make the human demonstrations superior to what would be afforded in ordinary lecture demonstrations. The emphasis throughout is on the actual text of Willis' translation of Harvey's book and on the anatomic and physiological material. This film is of special interest to students of medicine and to interns in that it demonstrates how much can be done with careful observation and very little apparatus. The archaic style of Willis' translation will make this film hard for some to follow; however, it could be seen profitably by every medical student at some time in his career. It should be shown to classes in physiology in the freshman or second year of medicine and again in the clinical years. The film will also be of value to those interested in the history of medicine.

Videclinic: Mind and Medicine: 16 mm., black and white, sound, showing time 46 minutes. Produced in 1955 by the Smith, Kline & French Medical Television Unit, in cooperation with the American Psychiatric Association and the American Medical Association. Procurable on loan (service charge $3) from Committee on Motion Pictures and Medical Television, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film is a Kinescope of a program originally produced for closed-circuit television that outlines the problem of mental illness and the latest weapons developed to fight it. The research aspects of mental illness, including the use of lysergic acid to produce symptoms in normal and abnormal people for study purposes, are covered first. Next is shown the dramatic new uses of drugs in the treatment of mental disease, and finally there is a report on the "open ward" system and "therapeutic communities" directly from Belgium and England. This film is recommended for medical society and hospital staff meetings.

The Doctor Examines Your Heart: 16 mm., black and white (cleared for television), sound, showing time 11 minutes. Produced in 1955 with the cooperation of the American Heart Association by Bray Studios, Inc., New York. Procurable on loan (service charge $2) from Committee on Motion Pictures and Medical Television, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film demonstrates the methods used by the physician in examining the heart and includes medical history, percussion to determine heart size, listening to the heartbeat with a stethoscope, determination of blood pressure and pulse rate, fluoroscopic examination, and use of the electrocardiogram. The purpose of the film is to show that, while the heart is the strongest organ of the body, it requires, like all mechanisms, a checkup in order to deal with inherent or developing irregularities. Logically, one should "service" the heart as one services an automobile or any mechanism that is in constant use. This interesting and attractive film is recommended for the general public. It will be useful to physicians who are called upon to speak on this subject to service clubs and can also be used in high school health education classes.

The Physiology of Reproduction in the Rat: 16 mm., color, sound, showing time 19 minutes. Prepared by Richard J. Blandau, M.D., and Anthony Canedo, University of Washington, Seattle. Produced in 1955 by the Department of Medical Illustration, University of Washington, supported in part by a grant from the Ortho Research Foundation. Procurable on loan (service charge $3) from Committee on Motion Pictures and Medical Television, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film attempts to show the complete external and internal changes that may be observed during the reproductive cycle in the rat, including various reproductive phenomena such as running, mating behavior, and related ear quiver. An animated sequence is used to illustrate the significance of the cyclic changes observed in the vaginal smear. The opening scenes of the film contrast the behavior of the female rat during the period of estrus with her behavior between periods. The external behavior of both male and female during mating is well shown, and the time relations of the estrus cycle are set forth especially well. The sequences showing the changes in the external and internal genitalia of the female during estrus are good. A dramatic moment is shown when the ovum that is discharged by the ovary is seen to enter the oviduct. After that, time-elapse photography shows the penetration of the ovum by the spermatozoa. These pictures show modern microscopic and photographic techniques at their best and are at once attractive because of the use of color and instructive because of the careful planning and editing. The narration is good. This film deserves the highest praise and can be shown to nurses and medical students as a part of their courses in physiology. Physicians will be interested in seeing it as it shows the latest in photography and microscopy. Instructors in college classes in zoology, genetics, or physiology will welcome the film as a rather complete presentation of the essence of reproductive physiology.

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MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Studies of the Physiology of the Dumping Syndrome. K. E. Roberts, H. T. Randall, H. N. Bane and others. New York J. Med. **55:**2897-2902 (Oct. 15) 1955 [New York].

Sixty experiments were carried out on 34 patients who had undergone gastrectomy to study the alterations in blood volume, extracellular fluid, and blood pressure after the ingestion of various foodstuffs consisting of hypertonic glucose, carbohydrates given in the form of corn starch or cooked potatoes, protein given in the form of beefsteak or as a powdered commercial preparation, and fat given in the form of vegetable oil or a commercial homogenized preparation. The patients showed at least three major metabolic defects, i. e., severe dumping symptoms, inadequate caloric intake, and defective fat and nitrogen absorption. The experiments indicated that the dumping symptoms are associated with an acute decrease in circulating blood volume and extracellular fluid, a decrease in blood pressure, and electrocardiographic changes consistent with myocardial ischemia. It has been postulated that the acute alterations in blood volume and electrocardiographic changes are triggered by rapid enzymatic hydrolysis of foodstuffs within the jejunal lumen and a subsequent breakdown of larger molecular particles into their smaller molecular components with a corresponding increase in osmolarity. As a result of the increased osmolarity, extracellular fluid is shifted into the jejunal lumen in an attempt to maintain the jejunal contents isotonic with the plasma. Carbohydrate substances were observed to have a greater effect than protein in triggering this chain of reactions. A dietary regimen has been proposed that is based on these findings and consists essentially of a high-protein, low-carbohydrate diet given at frequent feeding intervals. Preliminary results indicate that patients placed on this diet gained weight and showed symptomatic improvement.

Peptic Ulcer in Laennec's Cirrhosis. W. P. Swisher, L. A. Baker and H. D. Bennett. Am. J. Digest. Dis. **22:**291-294 (Oct.) 1955 [Ft. Wayne, Ind.].

Of 417 patients with Laennec's cirrhosis, 58, or 13.9%, had peptic ulcer in addition to their liver disease. Fifty-one had duodenal ulcers, and seven patients had gastric ulcers. X-ray evidence of duodenal ulcer was found in 47 cases. Postmortem examination revealed one healed duodenal ulcer and three active duodenal ulcers not demonstrated by x-ray studies. Gastric ulcer was diagnosed in six patients by roentgen examination and in one patient at autopsy. The presence of peptic ulcers in 13.9% of patients with Laennec's cirrhosis is far above the expected incidence of peptic ulcers in hospitalized patients. Sixteen or 28% of the 58 patients with hepatic cirrhosis and peptic ulcer were hospitalized because of hemorrhage from the ulcer. The physiological and pathological states present in cirrhosis may increase the predilection toward peptic ulceration. Possible predisposing factors are: absence or relative absence of neutralizing bile salts from the gastrointestinal tract, stimulatory effect of alcohol on hydrochloric acid secretion, direct inflammatory effects of alcohol on gastric and duodenal mucosa, increase of portal pressure and resultant venous stasis in bowel, malnutrition and altered serum proteins, impairment of the steroid metabolism, and finally psychosomatic phenomena. A combination of several such factors probably accounts for the increased incidence of peptic ulcer. Most important seem to be the direct stimulating and irritant action of alcohol, absence of neutralizing food, and perhaps a decrease in flow of bile salts and underlying psychiatric disturbances. No evidence was found in this series to incriminate portal hypertension, hypoproteinemia, or hyperbilirubinemia. This study indicates that one cannot assume that hematemesis or melena in a patient with Laennec's cirrhosis is always due to a ruptured esophageal varix. The common coincidental finding of peptic ulcer with Laennec's cirrhosis makes it imperative that an accurate diagnosis be made as soon as possible in any patient with Laennec's cirrhosis who is bleeding from the gastrointestinal tract.

Relations of Type of Tumor and Localization of Bronchial Carcinoma to Pulmonary Ventilation and Changes in Their Relationship by Exogenous Influences (Chronic Bronchitis, Pneumonia, Smoking). B. Löhr and A. Wagner. Arch. klin. Chir. **280:**592-608 (No. 6) 1955 (In German) [Berlin Germany].

The clinical data of 435 patients with bronchial carcinoma admitted to the surgical clinic of the University of Heidelberg, Germany, between 1947 and 1953, were studied in an attempt to draw conclusions from them concerning the origin of the disease. Because of the many factors involved and of the possibility of their combinations, the authors searched for unequivocal and constant features. Localization of tumor and type of tumor were observed as being suitable in this regard. Comparison of the localization of the tumors with pulmonary ventilation showed a parallelism in that, in 51% of the patients, the right lung and its bronchial branches were involved by carcinoma, and in 49% the left lung was affected, while the ventilation of the right and the left lung took place in a ratio of about 54 to 46. The percentage distribution of tumors thus corresponded with the respective sections of the lung. This correspondence between involvement by tumor and ventilation was observed likewise with regard to pulmonary lobes and various sections of the bronchial tree. It was therefore concluded that a cause and effect relationship exists between ventilation (i. e., inhalation of carcinogenic noxae) and involvement by tumor. Furthermore, it was found that, with the same percentage of involvement by tumor, the squamous epithelium carcinoma occurred more frequently in the central portions of the bronchial tree while the small cell carcinoma occurred more frequently in the peripheral portions of the bronchial tree. It was assumed that this relationship between localization of tumor and type of tumor would be changed with respect to the percentage of involvement by tumor as soon as exogenous stimuli of sufficient intensity occurred. Chronic bronchitis, pneumonia, and smoking were considered as such stimuli, and their effect on the relationship between localization and type of tumor was studied. For each of these three groups of patients a special predilection with regard to localization of the tumor was found, and predominance of squamous cell carcinoma was definitely shown in the group of patients with bronchitis and in patients who smoked. These findings confirmed the concept that the development of bronchial carcinoma depends essentially on exogenous stimuli; it was shown simultaneously that it can no longer be denied that bronchitis, smoking, and pneumonia play a part in its causation.

Insensitivity to Vitamin D Developing During the Treatment of Postoperative Tetany: Its Specificity as Regards the Form of Vitamin D Taken. C. E. Dent, C. M. Harper, M. E. Morgans and others. Lancet **2:**687-690 (Oct. 1) 1955 [London, England].

The authors present the histories of four patients in whom, after the accidental surgical removal of the parathyroids during operations on the thyroid, there developed chronic hypocalcemic

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The place of publication of the periodicals appears in brackets preceding each abstract.

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tetany. All showed a greatly increasing insensitivity to the hypercalcemic action of calciferol, even though the patients had been free of symptoms and normocalcemic before on smaller doses. When, instead of calciferol, the same or smaller doses of dihydrotachysterol (A. T. 10) were given to three of these patients, or of vitamin D_2 to the fourth patient, the symptoms of tetany were rapidly relieved and the plasma calcium level rose rapidly to normal. All of the patients are now well maintained on relatively small doses of the substituted vitamin D preparations. In two patients the change from calciferol to dihydrotachysterol and from calciferol to vitamin D_2 was carried out under metabolic control. This showed that the change of vitamin D preparations coincided with the onset of normal vitamin D action. It seems probable that, in the future treament of postoperative tetany, it will become necessary to change from one form of vitamin D to another. This curious phenomenon is likely to have some bearing also on the pathogenesis and treatment of those various forms of bone disease that include so-called "resistance to vitamin D" as one of their features.

A Thyroid Blocking Agent as a Cause of Endemic Goitre in Tasmania: Preliminary Communication. F. W. Clements. M. J. Australia **2:**369-371 (Sept. 3) 1955 [Sydney, Australia].

The results of two goiter surveys in Tasmania at an interval of five years and subsequent investigations strongly support the hypothesis that a significant amount of the endemic goiter in that state is due to the blocking effect of a substance or substances present in the diet of children. After a goiter survey in 1949 of some 8,000 school children, which confirmed that most of the island was goitrous, tablets containing 10 mg. of potassium iodide were distributed weekly to school children in Tasmania for the next five years. The second survey in 1954 showed a fall in the incidence of goiter in children of all ages in two districts, and in older girls in most districts; but there was a considerable rise in incidence in the younger children in most of the island, and the rate for boys equaled that for girls. This increase had occurred even in those schools where the distribution of iodine tablets was regular and complete. In the five years between the surveys, there was a considerable increase in milk consumption by children in Tasmania, owing to the introduction of the Commonwealth government's free milk scheme. To meet the demand for extra milk, a number of changes were made in dairy practice, including a great increase in the production of a forage crop, chou-mollier (thousand-headed kale), which is one of the Brassicæ. In view of the discovery by Astwood and his co-workers that some Brassicæ contain an antithyroid substance—namely, *l*-5-vinyl 2-thiooazolidone—it was decided to test for antithyroid activity milk, and extracts from milk, from cows fed chou-mollier and other Brassicæ. Tests were made with radioactive iodine, I^{131}. Two girls who drank the milk from cows fed chou-mollier had definite interference with the uptake of the I^{131} compared with the uptake of three other girls. A pair of identical twins was used, one in each group. Similar results were obtained in tests on other subjects with whole and skimmed milk, and to a lesser extent with various extracts. The investigation of milk from cows fed various Brassicæ is proceeding, and attempts are being made to obtain the antithyroid substance in a highly concentrated or pure form.

Tonsillitis and Splenomegaly. P. G. Cronk and P. G. I. Stovin. J. Roy. Army M. Corps **101:**231-234 (July) 1955 [London, England].

Nineteen of 185 British soldiers and their wives admitted to a hospital in the Suez Canal Zone with tonsillitis were found to have degrees of splenomegaly easily detected by routine palpation. Only in five cases was there adenopathy apart from tonsillar adenitis. Seven of the patients had had jaundice in the past, and one had had malaria. The clinical picture of tonsillitis, splenomegaly, and in a few cases cervical lymphadenopathy is rather suggestive of the anginose type of glandular fever, but white blood cell counts, blood film examinations, and repeated Paul-Bunnell tests ruled out glandular fever. The authors suggest that the probable connection between the tonsillitis and the splenic enlargement is the removal of neutralization of absorbed streptococcic toxins by the spleen as the main organ in the reticuloendothelial system. They think that this may occur more frequently than is realized in tonsillitis, though a search of the literature has failed to reveal any references to this combination of signs.

Painful Non-Arthritic Disturbances of the Hand and Wrist. E. C. Toone Jr. and J. Kawchak. Virginia M. Month. **82:**441-443 (Oct.) 1955 [Richmond, Va.].

Many lesions besides arthritis may affect structures near the joints. The authors discuss three painful syndromes of the hand and wrist, which are rather frequent but are often not diagnosed for months or years. Each may be treated effectively with relatively minor surgical procedures. The first is DeQuervain's disease, which is a painful syndrome resulting from the thickening and stenosing of the tendon sheaths of the abductor pollicis longus and extensor pollicis brevis at the ligament of the styloid process of the wrist. Activities such as typewriting, knitting, fly casting, golfing, piano playing, and work on grinding and buffing machines, which place these tendons under stress, predispose to this condition. The predominant early symptom is pain over the radial styloid process, which may radiate down into the thumb or up into the forearm. The discomfort is usually constant. The Finkelstein test, which is almost pathognomonic, is carried out by abducting the thumb across the palm, flexing the fingers over the thumb, and then sharply deviating the hand to the ulnar side. When the test is positive, an excruciating pain develops at the styloid process of the radius. Surgical treatment is simple and effective. The dorsal carpal ligament and the common sheath of the abductor pollicis longus and the extensor pollicis brevis are incised under local anesthesia. If the thickening is marked, the portions forming the roof of the osteofibrous canal are excised partially or completely. The carpal-tunnel syndrome results from compression of the median nerve by the transverse carpal ligament of the wrist and the contents of the carpal tunnel. Sensory symptoms constitute the earliest clinical feature and are limited to the distribution of the median nerve. At first, numbness may be present only during paroxysms of pain, but later a permanent hypalgesia and hypesthesia may be present. If the involved wrist is held in flexion for 60 seconds, there may be rather marked accentuation of symptoms. Also, the sensory changes may be accentuated by percussion over the median nerve. Surgical treatment consists of sectioning the transverse carpal ligament, thus decompressing the carpal tunnel. A successful operation is usually followed by prompt disappearance of pain and paresthesias and restoration of normal motor function. The trigger-finger syndrome results from a stenosing tendovaginitis of the digital flexor tendons of the thumb or lesser fingers usually at the metacarpophalangeal or the proximal interphalangeal joint. A number of these patients will improve with immobilization. If no improvement follows three weeks' conservative treatment, the tendon sheath constriction can be released by a simple surgical procedure. None of these conditions responds to medication usually employed in treating arthritic lesions.

Insulin Resistance and Scarce Insulin Sensitivity in Pancreatic Diabetes: One Clinical Case. T. Chiarioni and E. Nardi. Gior. clin. med. **36:**1091-1114 (Aug.) 1955 (In Italian) [Bologna, Italy].

Resistance or low sensitivity to insulin in patients with pancreatic diabetes may be due to infectious disease and febrile episodes; formation of anti-insulin antibodies; markedly decreased hepatic functional activity; excess insulinasic activity; anterior hyperpituitarism; hyperadrenalism; or hypertonia of the sympathetic nervous system. The authors report the case of a 44-year-old man whose sugar level when first seen was 190 mg. per 100 cc. and who was not benefited by diet and insulin. After eight months the blood sugar level was 240 mg. per 100 cc. He was then hospitalized, and, despite a diet without carbohydrates and insulin administration, the glycosuria and acetonuria remained extremely high. A dose of 120 units of insulin and a diet containing 60 gm. of carbohydrates daily caused, after 20 days, the disappearance of the ketosis, but the glycosuria and the subjective symptoms remained unchanged. Comparing the quantity

of carbohydrates ingested and that lost in the urine, it was evident that the ratio between the grams of carbohydrates utilized and the units of insulin administered was significantly below the ratio that is usually found in patients with uncomplicated diabetes. A cycle of 12 x-ray irradiations to the hypophysis (130 r per session) on alternating days and intramuscular administration of 5 mg. of testosterone caused the glycosuria to disappear, and the daily amount of insulin could be reduced. The patient was discharged and instructed to eat a diet like the one at the hospital and to continue with the same dose of insulin. This was a case of pancreatic diabetes aggravated by the patient's low sensitivity to the action of insulin. This aspect of the disease did not seem attributable to inactivation or destruction of insulin but rather to factors inherent in the neuroendocrine constitution of the patient, in particular to a moderate anterior hyperpituitarism and, even more, to hypercorticalism. A lability of the patient's neurovegetative tonus with a tendency to episodes of hypertonia of the sympathetic nervous system may have been a collateral factor.

A New Corticosteroid: Metacortandracin. L. de Gennes and B. Mathieu de Fossey. Presse méd. **63:**1270-1273 (Oct. 1) 1955 (In French) [Paris, France].

Metacortandracin (prednisone) has an anti-inflammatory action greater than that of cortisone; the amount has been reported to be 2.5 to 4.6 times greater, depending on both author and patient. The drug has given good results in arthritis, ankylosing spondylitis, acute gout, arthrosis, rheumatic fever, asthma, disseminated lupus erythematosus, periarteritis nodosa, some of the milder dermatoses, and scleroderma. Fair results have been obtained in acute leukemia, lymphosarcoma, and lipid nephrosis. Metacortandracin is inert with respect to the sodium ion and therefore causes no retention of either sodium or water. Patients receiving this hormone do not have to be put on a low-sodium diet. Most authors agree that potassium supplements are not necessary either but that a diet rich in proteins will supply enough of this element to replace whatever small amount is depleted by the drug. Metacortandracin increases the amount of hydrochloric acid in the gastric juice more than does hydrocortisone, but it has little effect on gastric juice volume and none on uropepsin secretion. The hormone has some catabolic effect on tissue proteins, but this disappears after the first few days of treatment. It stimulates erythropoiesis and causes an increase in hemoglobin. It has the usual side-effects of hypercorticalism and psychic disturbance. In general, it appears that this new steroid can replace cortisone and hydrocortisone, except in the treatment of adrenal cortical hypofunction.

Treatment of Recurring Pyelonephritis. E. M. Blegen and H. N. Haugen. Tidsskr. norske lægefor. **75:**603-606 (Sept. 1) 1955 (In Norwegian) [Oslo, Norway].

The importance is stressed of recognizing the origin of symptoms of urinary infection, such as frequent, painful micturition, fever, and pyuria, which in a large proportion of cases is a relapsing pyelonephritis. Decisive diagnosis depends on careful microscopic examination of the urine. In the intervals between relapses there may be no symptoms. Recurrence means flare-up of a surface process while at the same time a deeper process in the kidneys is active. Since late in 1952 the authors have treated recurring pyelonephritis with a combination of agents that exert their effect on both the surface processes and the deeper processes. Sulfonamide and sodium bicarbonate are given alternately with a mandelic acid preparation and ammonium chloride for two weeks' courses, respectively, and a total of eight weeks' treatment. Alkaline ash and acid ash diets are applied during the respective courses. In some cases 0.5 gm. of streptomycin was administered twice daily for five days simultaneously with sulfonamides. Up to the end of 1954, 30 patients (3 men, 27 women) were treated. Follow-up of 20 of these from 2 to 28 months after treatment ended showed 17 to be free from symptoms, with normal urine. There were no complications. Complete recovery cannot be expected in all cases: there may be a chronic glomerulonephritis complicated with pyelonephritis or the pyelonephritis may be so advanced that irreversible changes have developed in the kidneys.

Renal Biopsy in Glomerulonephritis and Nephrotic Syndrome. H. Gormsen, T. Hilden, P. Iversen and F. Raaschou. Nord. med. **54:**1341-1348 (Sept. 1) 1955 (In Danish) [Stockholm, Sweden].

With regard to the purely practical value of renal biopsy in the diagnosis, differential diagnosis, prognosis, and treatment of glomerulonephritis, the authors conclude that the method, provided that the biopsy is ample enough to be considered representative, definitely establishes whether the clinical diagnosis is correct, definitely evaluates the gravity of a glomerulonephritis, estimates duration only fairly well, and determines whether there is an acute glomerulonephritis or an acute flare-up of a previously existing chronic glomerulonephritis, which is important in deciding the duration of confinement to bed. In patients with nephrotic syndrome, renal biopsies can give the etiological diagnosis. In cases of oligoanuria of vague etiology, the results of biopsy can be decisive in determining whether hemodialysis should be carried out. It is often impossible on the basis of clinical criteria alone to determine whether an oligoanuria depends on a grave acute or chronic glomerulonephritis, in which case hemodialysis must presumably be regarded as useless, or on an acute tubulointerstitial nephritis with intact glomeruli, in which case hemodialysis will sometimes be indicated.

Oral Hydrocortisone Therapy in Rheumatoid Arthritis: An Appraisal of General Results of Prolonged Administration. E. W. Boland. Ann. Rheumat. Dis. **14:**232-237 (Sept.) 1955 [London, England].

Results of prolonged oral hydrocortisone therapy in 150 consecutive patients with active peripheral rheumatoid arthritis were analyzed. Treatment was continued for from 9 to 36 months. At the time of analysis, treatment had been discontinued in 24 patients for the following reasons: insufficient clinical response in 4, major complications in 2, complications unrelated to hydrocortisone in one, death from extraneous causes in 5, and remission in 12. The chief factors that influenced the success of therapy were the severity or activity of the disease and the duration of arthritis before treatment. At analysis, improvement was graded as adequate in 36% of patients with severe disease, 57% with moderately severe disease, and 88% with moderate disease. Results were more favorable when the arthritis was of relatively recent origin; the crucial duration was about two years, and thereafter as duration lengthened the proportion of adequate response lessened. As time went on, fewer patients showed adequate improvement. The disease was restrained satisfactorily in 72% at 6 months and in 59% at 18 months. Fifty of the 150 patients showed evidence of progression during the observation period. Although hydrocortisone is a valuable agent in the management of selected cases of rheumatoid arthritis, it is far from an ideal suppressive agent. Like cortisone, it has many shortcomings, chief among which are the hormonal side-effects, especially when dosage requirements are large; the tendency to aggravate certain coexisting pathological conditions; the development of unresponsiveness in some patients after prolonged administration; and the failure to prevent disease progression in an appreciable percentage of cases.

Acute Hemolytic Anemia in Infectious Mononucleosis: A Report of a New Case and a Review of the Literature. L. J. Kirkham. J. Iowa M. Soc. **45:**525-530 (Oct.) 1955 [Des Moines, Iowa].

Eleven cases of infectious mononucleosis associated with acute hemolytic anemia were collected from the literature. A new case is described in an 8-year-old girl who had been ill for a week with malaise and fever. At the onset she had three or four erythematous papules scattered over her body, but they cleared completely within three days. She also complained of some mild pain in her right shoulder, and of mild upper abdominal pain. She was given 500 mg. of tetracycline (Achromycin), and on the evening of the same day she voided dark brown urine, and was admitted to the hospital. She voided similarly colored urine for the next four days. The patient was running a temperature of 103 F (39.4 C) and had a mild acute pharyngitis and definitely enlarged lymph nodes in all cervical areas and in the axillary,

epitrochlear, and inguinal regions. The spleen was palpable 3 cm. below the costal margin but was not tender. The liver was tender and was thought to be slightly enlarged. The blood cell count showed 3,890,000 per cubic millimeter red blood corpuscles, 12,000 per cubic millimeter white blood corpuscles, 86% lymphocytes, and 11% hemoglobin on the first day after admission, and 4,060,000 per cubic millimeter red blood corpuscles, 18,500 per cubic millimeter white blood corpuscles, 95% lymphocytes, and 11.5% hemoglobin on the fourth day after admission. Most of the lymphocytes observed in the patient's blood smear were considered typical of infectious mononucleosis. The treatment she received was essentially symptomatic, and in addition bed rest and 1 gm. of chloramphenicol (Chloromycetin) daily for five days. The patient was thought to be the first with infectious mononucleosis in whom hemoglobinuria occurred. She made a complete recovery. Although several of the previously reported 11 cases failed to satisfy the criteria completely, it is felt that hemolytic anemia unquestionably does occur in infectious mononucleosis and, further, that it is increasing in frequency. Most of these patients did not require special treatment, but some responded well to the steroid hormones, and one recovered promptly after splenectomy without a therapeutic trial of hormones. The mechanism of the hemolysis has not been clarified very much by the immunologic studies that were done. The hemoglobinuria that occurred in the author's case strongly suggested an intravascular hemolytic process, while the rapid response to splenectomy seen in another case supported the concept of hypersplenism and, therefore, an extravascular hemolytic process. Another concept is that of the production of hemolytic immune bodies, which was supported by the response of several patients to steroid hormones and also by the author's patient with hemoglobinuria. It seems that the possible mechanisms of hemolysis may differ from patient to patient, depending on the patient's previous exposure to antigenic agents. The increased incidence of hemolysis associated with infectious mononucleosis coincided with the advent of potent antibiotic agents, and, although more studies are required before antibiotics can be pointed out as the cause, it is felt that they may be to blame.

Variola in France in 1955: Epidemiology and Prophylaxis. B. Le Bourdellès, M. Berger, M. Rodallec and others. Presse méd. **63:**1247-1248 (Sept. 24) 1955 (In French) [Paris, France].

France has had eight epidemics of variola since the second world war. Three of the first five were known to have originated from carriers coming from North Africa, but the last three were brought from the Orient. The 1955 epidemic in Brittany was started by a French soldier on leave from the war in Indochina; it comprised 95 frank cases, with 20 deaths, and 11 abortive cases. The first cases were difficult to diagnose because of the protean nature of the disease developing in a semi-immunized population. There were many atypical and uneruptive forms. The extreme contagibility of the disease testified to the especial virulence of the far eastern virus. Importation of this virus is likely to become increased, by virtue of the enormous expansion of air travel. Prophylactic measures should, therefore, be practiced with greater strictness.

Systemic Blastomycosis: Report of a Case. V. H. Knight Jr. and W. W. Wilson. J. Florida M. A. **42:**275-277 (Oct.) 1955 [Jacksonville, Fla.].

The authors present the history of a 56-year-old man, who one year previously had noted the onset of exertional dyspnea, a mild nonproductive cough, and a wart-like growth on the right cheek. Later this skin lesion ulcerated, and a biopsy revealed double contoured bodies compatible with blastomycosis. A cutaneous lesion developed also on the wrist. Roentgen examination of the chest revealed a diffuse, bilateral, granular and nodular infiltration. Smears made from the skin lesion and the sputum showed Blastomyces dermatitidis, and this finding was confirmed by mycologic culture. Despite abnormalities in the hepatic and renal functions, the authors resorted to treatment with stilbamidine. The recent introduction of 2-hydroxystilbamidine is an advantage, as it is less influenced by sunlight than is stilbamidine. The drug is administered intravenously, usually in doses of 150 mg. dissolved in 500 ml. of 5% glucose. The drug is administered daily, until a total dose of 3.5 to 4.6 gm. is reached. The man whose history is presented received a total of 4.2 gm. of stilbamidine in a period of 30 days. He showed slow but progressive improvement. Nine months after the completion of treatment he felt well, except for a mild disturbance in the sensory portion of the trigeminal nerve, which, however, has slightly improved since its first appearance three months after treatment. This case illustrates the effectiveness of stilbamidine in a highly fatal disease.

Nephritis Without Albuminuria (Acute Postinfectious Angiopathy). G. Czoniczer and T. Zsótér. Ztschr. ges. inn. Med. **10:**748-752 (Aug. 1) 1955 (In German) [Leipzig, Germany].

Of the four classical symptoms of diffuse glomerulonephritis (albuminuria, hematuria, edema, and hypertension), albuminuria is generally regarded as the most constant. Some authorities regard the diagnosis of acute nephritis as doubtful if albuminuria is absent. Among 30 patients with acute nephritis observed by the authors in the course of three and one-half years, there were 4 in whom albuminuria was absent. These patients ranged in age from 14 to 31 years. All four had had another disease from 3 to 14 days before the onset of the nephritis; one had had a "cold," two tonsillitis, and one sore throat. Edema and hypertension were present in all four, hypertension always persisting for from two to three weeks or even longer. Edema was usually of moderate degree and seemed limited to the face. In one patient the edema was latent, becoming apparent only as the result of treatment, which resulted in diuresis and loss of weight. Fasting always counteracted the edema in the course of about one week. That these patients actually had nephritis was demonstrated by the characteristic forms of hypertension and edema and by the fact that, in the later course of the disease, albumin always appeared in the urine, at least in small amounts. The authors suggest that this form, in contradistinction to the classical form of glomerulonephritis, could be designated as "acute postinfectious angiopathy," because they feel that vascular changes are the chief characteristic of this form of nephritis.

SURGERY

Considerations in the Surgical Treatment of Ventricular Septal Defects. E. B. Kay, H. A. Zimmerman and F. S. Cross. J. Thoracic Surg. **30:**452-468 (Oct.) 1955 [St. Louis].

Patent ductus arteriosus, atrial septal defects, and ventricular septal defects all represent essentially the same type of physiological lesion, that is, one with left to right shunting of blood with overloading of the pulmonary circulation. Surgical correction in each of these defects may be deferred until the optimum time arrives for intervention, unless the patient is getting into severe difficulties. Severe clinical symptoms and cardiographic and x-ray changes in a patient with a ventricular septal defect, however, should be taken as an indication for early cardiac catheterization and, if the intraventricular and pulmonary pressures are found to be elevated, surgical repair of the defect should be seriously considered. The repair must be made before the vascular changes caused by pulmonary hypertension become irreversible if the patient is to be benefited. Increasing pulmonary and right ventricular pressures add to the risk of surgical intervention, but the dangers of waiting should always be weighed against the risk of the operation. All the factors, including the age of the patient, the period during which the elevation of the pressures has existed, the size of the heart, the degree of pulmonary vascularization (by x-ray), and the pulmonary reserve, must be taken into consideration. Six patients have been operated on by the authors in the last two years, two by closed techniques and four through an open cardiotomy. The first closed-technique operation, in which a ventricular septal defect was repaired by a suture method in a 20-year-old white girl, was successful, and the patient is now able to lead a normal life. A second closed-technique operation, performed on a 5-year-old girl, failed when fatal ventricular fibrillation developed. Cross circulation was employed in three of the open cardiotomy operations, with one

successful closure and two deaths; in the other, no suitable donor was available, and an attempt was made to use a pump and a reservoir of oxygenated blood instead. Ventricular fibrillation developed, however, as soon as the ascending aorta was occluded, and a normal rate could not be restored. The many inherent difficulties encountered in attempts to repair ventricular septal defects by the open techniques now available make the continued investigation of closed techniques advisable. The principle of reconstituting the membranous ventricular septum by inversion and approximation of the pliable cardiac wall between the right atrium and aorta to the apical portion of the defect appears promising and is being utilized in all the closed techniques now being studied.

Experiences with Surgical Repair of Atrial Septal Defects. E. Watkins Jr. and R. E. Gross. J. Thoracic Surg. **30:**469-491 (Oct.) 1955 [St. Louis].

The atrial septal defects found in 43 patients operated on by the authors, though varying greatly in size and shape, tended to fall into the following five general categories, according to their location in the septum: (1) the common atrium defect (2 cases); (2) the so-called ostium primum defect, which the authors prefer to classify as an endocardial cushion defect, because it is related not only to inadequate fusion of the primitive atrial septum with the endocardial cushions (the anlage of the mitral and tricuspid valve rings) but also to incorrect maturation of the endocardial cushions themselves (4 cases); (3) the inferior defect, which must be distinguished from the endocardial cushion defect (5 cases); (4) the midatrial marginal defect, which was the commonest type encountered (28 cases); and (5) the superior marginal defect (15 cases). The fact that serious conduction disturbances and death may occur when the atrioventricular conduction bundle is traumatized or cut makes the identification and avoidance of this specialized tissue a matter of vital importance. It will be found anterior to a line drawn between the valve of the coronary sinus and the central fibrous body—two landmarks within the atrial chamber that can be palpated at operation. Definition of the landmarks and connecting line is now performed routinely during the exploration of all atrial septal defects. The endocardial cushion defect may prove suitable for closure by external suture, but the associated valve deformity introduces serious problems after closure. The common atrium defect seems to require some kind of prosthesis or tissue graft to avoid atrial and valve-ring distortion. Defects in the other three categories, which are located along the posterior margin of the atrial septum, constituted 86% of those seen in these patients; they are best suited for closure by the external suture method. The atrial wall method is now reserved for use in malformations that cannot be closed by external suture, either because of their large size or because they are situated anteriorly in the septum. Defects lying near a caval orifice should be closed by sutures introduced into the heart through the left atrial wall to avoid constricting the caval orifices by suture. Postoperative management has sometimes been complicated by the appearance of transient left ventricular failure. A prophylactic regimen of fluid limitation is therefore applied to all patients during the immediate postoperative period, and digitalis and mercurial diuretics are given if failure develops. Arrhythmias are frequent during this period of failure. Six of the nine deaths that occurred among the first consecutive 22 patients were due to technical errors that experience has since shown to be avoidable. Deaths in the last 21 patients were limited to two patients with advanced pulmonary vascular obstruction and two with serious atrioventricular valve deformity. These conditions are now regarded as contraindications to valve closure by present methods. Clinical improvement in the surviving patients has been striking. All have reported increased exercise tolerance and relief of symptoms.

An Analysis of Fifty Patients Treated by Mitral Commissurotomy Five or More Years Ago. R. P. Glover, T. J. E. O'Neil and O. H. Janton. J. Thoracic Surg. **30:**436-451 (Oct.) 1955 [St. Louis].

The first 50 consecutive patients in the authors' mitral commissurotomy series have been followed up, and the 41 survivors have been intensively studied in an attempt to ascertain their present subjective and objective status. All were operated on from five to six and a half years ago. Each of the 50 patients was suffering from some degree of functional incapacity; 20 had a definite history of rheumatic infection; 23 had a history of gross hemoptysis; 27 had had one or more bouts of congestive failure; and arterial emboli, from which a reasonable recovery had been made, had occurred in 6. Thirteen were in gross chronic congestive heart failure on admission to the hospital, and 19 were in permanent atrial fibrillation. Three patients died within the first postoperative month, and six died within the first three postoperative years. All the deaths occurred in patients with advanced stage 3 (progressively incapacitating) or stage 4 disease. Appraisal of the patient's subjectively reported clinical state and a correlation of the clinical findings, electrocardiographic tracings, teleroentgenograms, and catheterization data in each case warrant the conclusion that 30 (73%) of the survivors are in better condition and living a more nearly normal life than they were before the operation. The conservativeness of this estimate is shown by the fact that, according to their own and their family physician's appraisal of their present clinical status, 36 (88%) of the survivors are better now. No definitive conclusions concerning their present clinical status could be reached on the basis of their murmurs alone. Only 4 have a heart free from murmurs; 11 have lost all evidence of their original mitral diastolic murmur, but 14 now have mitral systolic murmurs of varying degrees that were not present before the operation. The best results from mitral commissurotomy are routinely obtained in patients with a pure murmur of mitral stenosis indicative of a small mitral orifice (cigarette size or less). Conclusive evidence of improvement does not regularly appear in the postoperative electrocardiograms, but electrocardiographic changes indicative of a definitive return to normal will be found in a considerable percentage of patients. Roentgenographic studies showed that, in 87% of these patients, the heart had remained at its preoperative size or had become smaller, whereas before the operation it was growing progressively larger. The functional state of the patients was paralleled and corroborated by all the cardiac catheterization data available. Valvular calcification was present before operation in 20 patients and in these the degree of improvement obtained, though satisfactory, was less than that obtained in those whose valves were free of calcium deposits. Eight patients showed definite evidence of rheumatic activity during the postoperative period. No evidence of restenosis has been observed in any of the surviving patients, nor was any present in the valves of those who died in the postoperative period. Only one patient had an operative embolus, and she has now completely recovered from her left hemiplegia, except for the finer motions of the hand. No postoperative emboli have occurred up to the present time. Commissurotomy has been of untold value to most of the patients in this series, and there is no reason to suppose that the improvement obtained will not continue.

Surgical Treatment of Coronary Insufficiency. J. N. Briggs and F. X. Byron. West. J. Surg. **63:**559-561 (Sept.) 1955 [Portland, Ore.].

The authors present a history of the various attempts at myocardial revascularization, giving special attention to the three commonly used procedures: the cardiopericardiopexy of Thompson, the arterialization of the coronary sinus advocated by Beck, and Vineberg's internal mammary implantation. The authors favor the cardiopericardiopexy or pericardial poudrage of Thompson. It is technically simple, requiring little equipment and no specialized training. This operation utilizes all the available collaterals, the pericardiophrenic arteries, the internal mammary arteries, the inferior phrenic arteries, and the adjacent mediastinal vessels. Furthermore, this procedure has had the greatest clinical trial, and some of Thompson's patients have been followed for 14 years. The authors have used Thompson's method in eight cases. As regards the selection of patients for this treatment, they say that it should be used only after failure of medical treatment. The heart may be moderately enlarged, but patients in heart failure are not suitable candidates. There are no age limits, but there is more risk in younger patients. Operations should not be performed within three months of an infarct and preferably six months should have elapsed. Of the eight

patients operated on by the authors, three have died, but only one of these was an operative death. It occurred on the sixth day after operation and was due to fresh infarction in a greatly narrowed coronary artery. This patient would not meet the present criteria for operation. The two late deaths were due to coronary infarction, but both patients had been improved by Thompson's criteria up until the time of death, 6 and 14 months after operation respectively.

Local Hypothermia of the Heart: Preliminary Report. D. Melina and C. Pollara. Gior. ital. chir. **11:**940-943 (Aug.) 1955 (In Italian) [Naples, Italy].

The authors' experiments with general hypothermia combined with a more pronounced local hypothermia of the heart were based on the fact that the "biological zero," i. e., the temperature limit at which point the specific functional activity of a cell ceases, of the myocardial tissue is much lower than that of the nervous tissues (30 to 24 C [86 to 75.2 F] according to the various zones). General hypothermia (rectal temperature of 28 C [82.4 F]) was rapidly induced in a group of dogs after they had been given deep Pentothal anesthesia. After the circulation was arrested by occlusion of the venae cavae, the azygos vein, the aorta, and the pulmonary artery, the heart was cooled directly by means of carbon dioxide, and its internal temperature, as measured with a regular thermometer after an atrial or ventricular cardiotomy, was lowered to 20 C (68 F). At this temperature, marked bradycardia (four to six pulsations per minute) was present. This method enabled the authors to interrupt the circulation for 30 minutes, during which time various surgical procedures were performed on the cavities of the heart. The authors state that the circulation can be interrupted in some cases for longer time (43 minutes in one dog) and that general hypothermia combined with more pronounced local hypothermia of the heart makes it possible not only to prolong the circulatory arrest but also to prevent the onset of a state of myocardial anoxia. Ventricular fibrillation, a much feared and often irreversible and fatal complication of general hypothermia, is also prevented.

Contralateral Pulmonary Metastases in Bronchial Cancer. A. Balmes and A. Thevenet. Presse méd. **63:**1297-1301 (Oct. 5) 1955 (In French) [Paris, France].

Five cases of contralateral pulmonary metastasis were noted in a series of 75 cases of bronchial cancer. A review of the literature showed that about 20% of bronchial cancers metastasize into the contralateral lung; only 10% are detectable radioclinically. Secondary cancer of the lung represents about 30% of cancer metastases in general. Recent figures show that the primary tumor is located in the bronchi in about 5% of cases. The circumstances of the clinical appearance of these metastases are of four types. 1. They may be noted at the time of initial examination revealing cancer or even before the primary tumor manifests itself. 2. They may be secondary metastases, i. e., manifesting themselves in the weeks following discovery of the initial lesion. In such cases, as in those of early metastases, the cancer has revealed itself late and is inoperable. 3. The metastases may appear late, after surgical treatment of the bronchial cancer. 4. They may be latent, in which case they are not found before autopsy. As to their route of propagation, it seems that they spread not only through lymph channels and blood vessels but also through the bronchi by aspiration. Most of the contralateral metastases are of the cavitary or epidermoid type. Radiologically, they are seldom miliary but often nodular, taking the form of multiple or isolated rounded opacities. As mentioned, the early and the secondary metastases are a bad prognostic sign, but late metastases in the contralateral lung are amenable to surgical therapy.

The Surgical Aspects of Portal Decompression. C. W. Hughes and E. J. Jahnke. Am. J. Gastroenterol. **24:**372-377 (Oct.) 1955 [New York].

Of 52 patients with portal hypertension who had end-to-side portacaval and splenorenal shunt operations, follow-up studies were completed in 30. Twenty-eight (93.4%) of the 30 patients had portal hypertension caused by intrahepatic block, and in only 2 (6.6%) was it caused by extrahepatic block. No patient was denied surgical intervention because of severe dysfunction of the liver. The first patients operated on had had hemorrhages from esophageal varices. Because of the highly satisfactory results of the operation in these patients, its indications were extended to encompass those patients with portal hypertension and extensive esophageal varices in whom hemorrhages had not occurred. Only 2 of the 30 patients had a shunt performed as a prophylactic measure. The direct portacaval shunt operation proved to be the procedure of choice, since a larger anastomosis can be obtained between the two systems by this method than by a splenorenal shunt, which is more difficult technically to perform and more time-consuming. Preoperatively, esophagoscopy was carried out routinely to determine size and extent of esophageal varices; manometric pressure readings were taken in the esophageal varices without complications. Techniques of portal venography and portacaval and splenorenal anastomoses are presented. Comparison of preoperative and postoperative manometric pressures taken in the portal vein showed a drop in portal pressure of over 200 mm. of sodium chloride solution after shunting procedures in most of the patients. Preshunt vena cava pressures were observed to range up to 220 mm. of sodium chloride solution; after the shunting procedures, the portal pressure equalized with the venacaval pressure and obviously could not be dropped below the initial venacaval pressure. Postoperative studies of the esophageal varices by esophagoscopy showed disappearance of some of the varices and decrease in size and pressure of others. When pressure readings were obtainable in the remaining varices, they were comparable to the pressure in the portal vein after the shunting procedure. While there appeared to be a correlation between the portal vein and esophageal varix pressures, there did not appear to be a correlation between size of the varices and tendency toward hemorrhage. Only two patients had minor hemorrhages from esophageal varices postoperatively, but both had demonstrable esophageal varices. Postoperative liver function studies showed temporarily increased dysfunction apparently related to anesthesia and operative trauma. Alterations in hepatic function, however, persisted only for 7 to 10 days. Only two patients died of liver failure as a result of surgery. The authors believe that maximum preoperative preparation, minimal anesthesia and operative trauma, minimal blood loss, and the use of chlortetracycline (Aureomycin) postoperatively for 10 days is responsible for keeping the mortality rate to a minimum and for the gratifying results thus far obtained.

The Medical Aspects of Portal Decompression in Cirrhosis. I. C. Plough. Am. J. Gastroenterol. **24:**378-383 (Oct.) 1955 [New York].

Portal hypertension and collateral venous pathways are frequently a late complication of cirrhosis, brought about by constriction of the intrahepatic portal bed by fibrosis and nodular regeneration of the damaged liver. Such patients may appear to have recovered completely from hepatic decompensation, only to bleed suddenly from esophageal varices. The only effective operations to reduce portal hypertension appear to be those in which a direct shunt is constructed from the portal venous system to the inferior vena cava or its branches. The source of bleeding should be accurately determined by x-ray and endoscopic examination. The nature of the liver disease and the specific location of the block in the portal system must be decided by careful, complete medical evaluation before the operation. Intractable ascites is not an indication for the shunt operation. Shunt operations may be done on patients with varices from which hemorrhage did not occur, but the value of the operation has not yet been established with statistical reliability, because very little is known of the natural history of esophageal varices. Severe impairment of liver function is a relative contraindication to operation. More than a slight degree of jaundice and depression of the serum albumin below 2 gm. per 100 cc. make the operation very hazardous. In such patients, the chances of recurrent hemorrhage must be balanced against the markedly increased operative mortality in coming to a decision. Patients selected for shunt operations demand very careful attention from the internist before, during, and after operation. Preoperative treatment consists of rest, proper diet, and withdrawal of alcohol.

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There is no need for blood transfusion, which carries the hazard of homologous serum hepatitis, except after hemorrhage. Patients with severe liver damage are extremely susceptible to sedatives and narcotics, particularly morphine. These medicaments should be used in reduced doses or not at all. The duration of operation and anesthesia must be kept as short as possible. Hypotension must not be permitted to occur. Careful blood and fluid replacement is necessary. The routine postoperative use of chlortetracycline (Aureomycin) is recommended because of its reported good effect in hepatic coma. Conservatism is urged in ambulation of patients convalescent from operation. Because of recent evidence that high protein feeding is occasionally toxic after shunt operation, it is recommended that there be no forcing of the patient's protein intake.

Indications and Contraindications in Hypodermoclysis with Hyaluronidase in Surgery of the Digestive Tract. A. G. Weiss and L. Hollender. J. chir. **71:**673-686 (Oct.) 1955 (In French) [Paris, France].

Hypodermoclysis with hyaluronidase permits the use of the subcutaneous route of administration of parenteral fluid therapy, which is more physiological than the intravenous route. The authors have used it successfully over 300 times in patients who had had surgical interventions on the digestive tract. Hyaluronidase triples the rate of absorption of fluids administered subcutaneously, thereby eliminating local stagnation and distention. The rate of absorption is a function of the nature of the liquid injected. Isotonic sodium chloride solution of 9 per thousand penetrates more rapidly than 5% glucose solution, but the latter is absorbed faster than alcohol solution of 19 per thousand. Vitamin C, adrenoxyl, Phenergan, and other agents inhibit the effect of hyaluronidase and distinctly slow up the process of absorption. Macromolecular fluids injected subcutaneously with hyaluronidase are poorly absorbed. The method has certain definite contraindications. It should not be applied to patients whose metabolism is seriously disordered, those who are in acute or chronic shock or peripheral collapse, or those who need rapid increase of their circulating fluid volume. It is also not advisable in diabetics; patients with malignant disease; those with local infection or septicemia; those receiving corticotropin, cortisone, antihistaminics, or estrogens; those with certain dermatoses, notably eczema; those with cellular hyperhydration; and those with protein deficiency.

Early Post-Cibal Symptoms Following Gastrectomy: Aetiological Factors, Treatment and Prevention. W. M. Capper and R. B. Welbourn. Brit. J. Surg. **43:**24-35 (July) 1955 [Bristol, England].

In an attempt to collect reliable data on some of the controversial aspects of early postcibal symptoms in patients who have undergone gastrectomy, the authors sent a questionnaire to some 50 physicians and surgeons whom they knew to be particularly interested in gastric surgery. This paper is based on replies to these questionnaires, on recent publications, and on data secured by the authors themselves. They differentiate two types of early postcibal symptoms: the dumping syndrome proper and bilious vomiting. Early postcibal symptoms improve spontaneously during the first 12 to 18 months after operation; after this the incidence remains constant. Patients with extensive lesions at the time of operation tend to have less severe postcibal symptoms. Women on the whole fare worse than men. Postcibal symptoms are rare after gastroenterostomy. After gastrectomy there is no clear evidence that their frequency or severity bears any relation to the amount of stomach resected. An antecolic anastomosis possibly gives better results than a retrocolic. There is no evidence that a valve or the site of attachment of the afferent loop is significant. Postcibal symptoms are less persistent and less severe after a Billroth 1 anastomosis; loss of weight is less and colic and diarrhea are also less frequent, but the recurrence rate after the Billroth 1 procedure for duodenal ulcer is higher than it is after gastrojejunal anastomosis. In the initial stages of postcibal symptoms, explanation and reassurance are important. Careful analysis of dietary habits is valuable. Milk, sweet things, and food in liquid form may be causative factors. Meals should be taken dry and drinks only between meals. Lying down for half an hour before a meal greatly reduces bilious vomiting, and lying down to eat or for half an hour after food reduces dumping. Local anesthetics by mouth, hexamethonium bromide, and sodium bicarbonate, all before meals, may improve dumping symptoms. Bilateral paravertebral splanchnic block with procaine probably gives the greatest relief, which may be permanent. Surgical measures to give relief should be considered only when symptoms are severe and disabling and have persisted for at least 18 months after operation. Enteroanastomosis, jejunoplasty, and Roux-en-Y anastomoses usually relieve bilious vomiting, but relapse is common. As a primary procedure, the Roux-en-Y anastomosis prevents bilious vomiting. After any of these procedures, constant watch must be kept for recurrent ulceration. Support for the afferent loop and lesser curvature of the stomach may relieve or prevent dumping symptoms. Conversion to a Billroth 1 anastomosis usually relieves bilious vomiting, dumping symptoms, and diarrhea, causes increase in weight, and reduces fecal fat loss. Jejunal and colonic replacement of the stomach gives similar results, but jejunal ulceration is common after the former. In the present state of knowledge, conversion to a Billroth 1 is the procedure of choice for the surgical treatment of all types of postgastrectomy symptoms where a gastrojejunal anastomosis is present.

Operative Cholangiography. J. H. Gifford and S. C. Kahlstrom. West. J. Surg. **63:**605-606 (Sept.) 1955 [Portland, Ore.].

The studies reported were concerned with the proper evaluation of operative cholangiography. Two groups of cases, each consisting of 100 consecutive cholecystectomies for cholelithiasis, were investigated. All of these patients were operated on by a group of three surgeons who are associated as partners in the same office. In the first group, operative cholangiography was not used in any instance, and the decision to explore the common duct was based on palpation of a stone or the clinical indications of jaundice, dilatation and thickening of the duct, or a contracted gallbladder in patients with active symptoms. In this group the common bile duct was opened in 29 patients. Stones were found and removed in nine instances, while the remaining 20 patients had their ducts explored unproductively. In the second group, operative cholangiography was carried out in each instance, and the common bile duct was opened in 27 instances; 23 of these ducts were opened on cholangiographic evidence of stone, and stones were actually found in 21 patients, while in 2, air bubbles had been mistaken for stones. In the other four patients, in whom the cholangiogram showed no stones, the common duct was opened on clinical indications. Residual stones were proved in six patients and strongly suspected in another eight patients of group one, whereas in group two stones were left behind in only three patients. The authors conclude that the so-called clinical indications for common duct exploration are fallible and that they lead to exploration of the wrong ducts. Operative cholangiography is not infallible, but it is a more accurate method for determining the presence of common duct stones than palpation or clinical indications.

Surgical Treatment of Local Carcinoma Recurrences and Metastases, Respectively. H. Rosolleck. Arch. klin. Chir. **280:** 573-576 (No. 6) 1955 (In German) [Berlin, Germany].

Surgical treatment was practiced for local recurrences or easily accessible metastases in 22 patients, of whom 20 had been operated on previously for carcinoma of the breast, one for carcinoma of the penis, and one for carcinoma of the anus. The operation for local recurrences or metastases was preceded, in all of the patients, by a thorough clinical examination that definitely excluded the occurrence of generalized (distal) metastases. Extensive excision far into the healthy tissue is imperative. The survival time after the primary operation varied from 2 to 17 years, and the survival time after the operation for local recurrence or metastases varied from three months to six years. Because of the difficult conditions prevailing after the war, most patients did not receive irradiation treatment after the primary operation. When local recurrences or metastases were first observed, the patients first were referred to the roentgenologist for irradiation treatment, but irradiation alone failed

to remove the tumor tissue and surgery had to be done. The fallacy of the statement made by some roentgenologists that surgical treatment preceding roentgen irradiation for local recurrence or metastases is not advisable because results of subsequent irradiation of scar areas are poor was demonstrated. Since life was considerably prolonged in some of the patients who underwent surgical treatment for local recurrence or metastases, the author pleads for surgical removal (with the exclusion of distal metastases) with subsequent roentgen irradiation, a method of management that is superior to that of roentgen irradiation alone. Hormone therapy does not seem to be appropriate in patients with local recurrence or metastases of cancer of the breast; it should be reserved for patients with generalized metastases in whom surgical treatment or roentgen irradiation is no longer feasible.

NEUROLOGY & PSYCHIATRY

Poliomyelitis Complicating Pregnancy. J. R. Bergquist and W. P. Sadler. Minnesota Med. **38:**668-673 (Oct.) 1955 [St. Paul].

Five hundred sixty-eight patients with acute anterior poliomyelitis were admitted to the contagion division of the Minneapolis General Hospital during the 1952 poliomyelitis epidemic. There were 88 women between the ages of 15 and 45 years, and 24 (27.3%) of them were pregnant. It has been estimated that between 6.2% and 11% of the female population in the child-bearing age will be pregnant at any one time. While the exposure rate was found to be higher in the nonpregnant woman than in the pregnant, the incidence of poliomyelitis in the pregnant women reported on by the authors confirms the statement by other workers that the attack rate is apparently higher in the pregnant woman. Three of the 24 women died, giving a maternal mortality rate of 12.5%, which is not greater than that in the nonpregnant women with poliomyelitis. Five of the 24 women aborted, giving an abortion rate of 20.8%, no higher than that expected for the general population. Of the 24 women, 12 were in the third trimester of pregnancy, 6 in the second, and 6 in the first. All three deaths occurred among the women in the third trimester. Eight of the women in the third trimester had the spinal paralytic type and four the bulbar spinal type of poliomyelitis. Of the six women in the second trimester, two had the nonparalytic type, three the spinal paralytic type, and one the bulbar type of the disease. Of the six women in the first trimester, four had the nonparalytic type and two the spinal paralytic type. Ten of the 12 women in the third trimester died or had severe residual paralysis. Thus, the most severe cases occurred in the last trimester of pregnancy, showing the varied picture poliomyelitis can present. Severe residual paralysis resulted in 8 (33.3%) of the 24 women, and mild residual paralysis in 7 (31.4%). There were four respirator cases in the entire group. Early tracheotomy, endotracheal suction, bronchoscopy, and positive pressure administration of oxygen greatly facilitated delivery in the respirator cases. The labor was conducted according to accepted standards. Most of the patients delivered spontaneously, and it was felt that labors were definitely less painful and shorter than in normal pregnant women; this might have been the result of relaxed perineal muscles and high pain threshold. Analgesic, amnesic, and sedative drugs are interdicted. Pudendal block with procaine was adequate anesthesia for most patients. Postmortem hysterotomy was unsuccessful to effect fetal salvage. Growth and development in surviving infants were normal.

The Clinical Response of Psychoneurotics to Chlorpromazine. M. Silverman. J. Ment. Sc. **101:**640-643 (July) 1955 [London, England].

Chlorpromazine hydrochloride, or Largactil, was given to 50 patients with psychoneurotic disorders in outpatient departments of general hospitals. Chlorpromazine was given in oral doses ranging from 25 mg. three times a day to 75 mg. three times a day. Approximately three-fifths of the patients gained substantial benefit from the treatment. Anxiety states showed a better response than the other diagnostic groups. This supports the view that the main effect of the drug is in the relief of tension. Some obsessional states showed material improvement. Some investigators suggested that obsessional patients should not undergo prefrontal leukotomy until chlorpromazine has been given a trial. Hysterical and depressive reactions did not respond well. Patients in the first four decades fared better than the older age groups.

Prolonged Sleep Treatment in Mental Disorders (Some New Psychopharmacological Considerations). H. Azima. J. Ment. Sc. **101:**593-603 (July) 1955 [London, England].

A prolonged state of sleep, approximating as much as possible the normal physiological state, was accomplished by the combination of different barbiturates and chlorpromazine (Largactil). The minimum daily sleep time was 20 hours, and the average duration of treatment, 25 days. This report is based on a study of 25 patients who were followed up for five months or more. These 25 patients had not responded to any other form of treatment, ranging from electric shock to long-term psychotherapy, and in each case the sleep treatment was used as the last resort. The group included eight patients with schizophrenia, two with manic depressive psychosis, three with obsessive compulsive neurosis, nine with mixed psychoneurosis, two with hysteria, and one with character neurosis. Improvement was noted in 60% of the cases. This improvement was based upon social and behavioral normalization. There were very few complications: two transitory maculopapular rashes; postsleep convulsive seizures in two patients, one being a recognized epileptic before treatment; and one case of pneumonia, which responded very rapidly to antibiotics. The following tentative list of indications for prolonged sleep treatment is proposed: neuroses, in particular conversion hysteria, anxiety hysteria, and borderline cases; hypochondriacal and psychosomatic syndromes; and schizophrenic reaction with preponderance of affective alterations. Patients with obsessive compulsive neuroses do not respond to sleep, and patients with mania respond to chlorpromazine alone.

Columnotomy in the Treatment of Unreduced Dorsolumbar Vertebral Fractures with Cord Lesions. G. J. Renes. Arch. chir. neerl. **7:**269-279 (No. 3) 1955 (In English) [Arnhem, Netherlands].

In Indonesia, where many hospitals are overcrowded and understaffed, inadequately treated traumatic injuries, such as cord lesions caused by unreduced vertebral fractures, are not uncommonly seen. Most of these injuries are caused by falls from trees. Twenty-three patients with persistent cord lesions caused by unreduced dorsolumbar vertebral fracture were treated surgically. Two are still in plaster jackets; in another patient the operation had to be discontinued because of simultaneous injury to the parietal pleura and severe hemorrhage from a lumbar artery, causing shock. Twenty patients remain for discussion. In seven of these only a laminectomy was carried out. This report is chiefly concerned with the 13 patients, who, after preliminary laminectomy, were treated by columnotomy and reduction of the spine. These patients were operated on from 5 to 27 months after the original injury. A columnotomy with reduction of flexion-angulation and posterior dislocation was carried out using La Chapelle's operation as modified by Allaart. Postoperative roentgen examination revealed that complete reduction was obtained in only one case; 2 remained unchanged, the other 10 cases showing reduction of flexion-angulation by an average of 14.4 degrees. Posterior dislocation in eight cases was completely reduced in two and partially reduced in six. Five patients were greatly improved, two were moderately improved, two slightly improved, three patients remained unchanged, and one patient became slightly worse. In this series clinical improvement appeared to be dependent on the degree of reduction of flexion-angulation. Serious delay in treatment did not worsen the results of operative reduction by columnotomy in these unreduced cases.

A Case of Transverse Myelitis Following T. A. B. Inoculation. T. P. H. McKelvey. J. Roy. Army M. Corps **101:**191-195 (July) 1955 [London, England].

The author presents the history of an 18-year-old soldier in whom a transverse myelitis of the cervical spinal cord developed 15 days after he received a second injection of T. A. B. (typhoid,

paratyphoid A and B) vaccine. It was considered that the spinal cord lesion was probably a thrombosis affecting the cervical cord. The absence of other apparent cause of the transverse myelitis—e. g., trauma, syphilis, or other infection, bacterial or viral—and its relatively close sequence to his T. A. B. and other inoculations led to the consideration that it might be associated with those inoculations. Neurological sequelae after T. A. B. inoculation have been classified as syndromes of radiculitis, or plexitis, and mononeuritis, of polyneuritis and Guillain-Barré syndrome, of Landry's paralysis and myelitis, and of cerebral and meningeal forms. Such sequelae occur most commonly after a second inoculation. In the case described here, the immediate effect was upon the cervical spinal cord involving the fifth cervical to first thoracic segments with no evidence of cerebral, brain stem, or meningeal involvement. There was no further spread. Death did not occur, but recovery was far from complete, there being residual weakness in the muscles of the upper limbs, particularly those innervated from the eighth cervical and first dorsal segment, and slight spastic weakness of the lower limbs. It is now thought that the pathogenesis of such neurological complications after prophylactic inoculation is that of an anaphylactic reaction affecting blood vessels. Success in treatment of encephalomyelitis after rabies inoculations, where a similar mechanism has been postulated, has been reported with antihistamines and cortisone. Antihistamine drugs and cortisone were not used in the case reported here. However, it is felt that consideration should be given to their immediate use in all cases showing evidence of neurological lesions after prophylactic inoculation, especially where there is evidence of spinal cord involvement.

PEDIATRICS

The Pulmonary Hyaline Membrane Syndrome. S. S. Stevenson and L. E. Laufe. Pennsylvania M. J. **58:**1101-1103 (Oct.) 1955 [Harrisburg, Pa.].

The pulmonary hyaline membrane syndrome has shown a real and alarming increase in incidence in the last 15 years. It now seems to be responsible for half the total mortality among premature infants and for more neonatal deaths in all live-born infants than any other cause. The infant presenting this syndrome, usually born prematurely or by cesarean section or to a diabetic mother, has mild respiratory difficulty shortly after birth as if he had aspirated amniotic fluid. He then seems to be well for three or four hours, after which breathing becomes progressively more labored. Repeated roentgenograms show increasing diffuse haziness of the lung fields, and the infant becomes more and more cyanotic. Approximately 50% of such babies die, usually before they are 48 hours old. Microscopic examination of the lungs reveals extensive atelectasis, vascular congestion, and an eosinophilic hyaline-like membrane that lines occasional dilated alveoli and alveolar ducts. Experiments with guinea pigs have shown that, when amniotic fluid, which has a thromboplastin-like activity, is superimposed upon pulmonary edema, 20% of the animals exhibit the respiratory symptoms of the disease and present the complete syndrome at postmortem examination. It seems probable, therefore, that the human disease is produced when aspirated amniotic fluid becomes mixed with a pulmonary exudate. The formation of pulmonary exudate in human infants may be due to several causes, including irritation of the lungs by high concentrations of oxygen. This last may well be important, especially in premature infants. The increase in the incidence of the pulmonary membrane syndrome, which occurred simultaneously with that of retrolental fibroplasia, took place during the years in which incubators capable of maintaining high concentrations of oxygen became available. Further work on the origin of the syndrome should be directed toward elucidating the causes of pulmonary edema in the neonatal period. Certain practical suggestions for the prevention and treatment of the disease can, however, be made on the basis of present knowledge. 1. Place newborn infants in a prone position. They will not smother, and constant postural drainage will be established. 2. Aspirate the stomachs of infants born by cesarean section to free them from amniotic fluid and debris. 3. Restrict oxygen to the amount needed to preserve life and prevent cyanosis. The concentration of oxygen should never exceed 45%. 4. Observe all newborn infants for heart failure and proceed to rapid digitalization if failure appears. 5. Prophylactic antibiotic therapy should be given to every newborn baby with respiratory difficulty, especially when it is accompanied by atelectasis. 6. Be prepared to withdraw air from the pleural cavity if pneumothorax develops and makes it necessary. 7. Withhold food and parenteral fluids from infants with this syndrome until convalescence becomes obvious (usually within 48 hours). Cortisone, estrogen, and the fibrin-lysing substances are potentially dangerous and should be avoided. Bronchoscopy, which cannot remove foreign substances far down in the bronchial tree and which is traumatizing in newborn infants, should not be attempted.

Treatment of Thyrotoxic Children with Thiourea Derivatives: Long-Term Follow-Up and Recent Experiences. R. H. Kunstadter and A. F. Stein. A. M. A. Am. J. Dis. Child. **90:**373-380 (Oct.) 1955 [Chicago].

Thiourea derivatives have been used by the authors during the last 12 years in treating 13 girls and 4 boys aged 5 to 15 years for mild to severe primary hyperthyroidism. The results obtained in these children, nine of whom were first reported on in 1949, may provide answers to the following questions concerning the advisability of prolonged treatment with the thiourea drugs. 1. Is permanent "cure" possible? 2. What dose should be administered and how long should the drug be taken? 3. What is its effect on growth and development? 4. What happens to the size of the goiter and the exophthalmos? 5. What are the advantages of prolonged medical treatment? The original nine patients have been observed for periods ranging from 6½ to 12 years; follow-up in the other eight varied from 4 months to 6 years. All the patients were hospitalized at the time treatment was begun. They were ambulant and received sedation for sleep only when it was deemed necessary. They remained in the hospital until clinical improvement appeared and/or the basal metabolic rate began to fall—usually not longer than two or three weeks. Five patients in all underwent thyroidectomy—one because of a thyroid nodule suspected of being a neoplasm, one because of marked enlargement of the thyroid, one because of psychotic episodes and cardiac complications during early treatment, one, who was badly disturbed, because of poor cooperation, and only one because of drug failure. Eight of the 12 patients followed under medical treatment alone are in remissions that have lasted 5 years or more in six and from 2 to 5 years in two. Treatment in the other four patients is continuing. The eight patients in remission received treatment lasting from 6 to 36 months. They tolerated large doses, in most instances full adult doses, without evidence of intoxication. Indications are that large initial doses result in earlier response, lessen the likelihood of early relapses, and may shorten the duration of treatment. Growth and development, including sexual maturation, progressed normally through puberty into adulthood in all the patients followed in remission for long periods of time. Goiter and exophthalmos have disappeared completely in some patients; in others, small or moderate goiters or mild exophthalmos, or both, are still present. Treatment with thiourea derivatives can not only be expected to produce "cures" of five years or more in a large percentage of patients, but it may also make it possible to avoid the complications of surgical intervention and the disturbances of endocrine balance resulting from thyroidectomy.

Congenital Absence of the Spleen. D. W. Polhemus and W. B. Schafer. Pediatrics **16:**495-497 (Oct.) 1955 [Springfield, Ill.].

A case of congenital absence of the spleen accompanied by persistent atrioventricularis communis, pulmonary atresia, right aortic arch, and transposition of the heart to the right side; partial situs inversus involving liver, gallbladder, pancreas, stomach, and duodenum; and accessory lobe of the left lung is described in a newborn infant girl, who died suddenly when 7 days old. She was born by spontaneous cephalic delivery and weighed 3,240 gm. (7 lb., 2 oz.), and her respiration was spontaneous and without dyspnea. She had persistent cyanosis that increased with crying and activity and was not benefited by

administration of oxygen. Heart sounds were heard best over the right side of the heart. There was also a soft heart murmur late in systole in this area. Agenesis of the spleen without other anomalies is excessively rare, whereas an increasing number of infants have been observed with certain specific anomalies in association with congenital absence of the spleen. This syndrome was originally described as including splenic agenesis, persistent atrioventricularis communis, partial situs inversus, accessory lobe of the left lung, and abnormal mesenteric attachments. In three cases of this type collected from the literature, a diagnosis of the syndrome was made before the patient died because of the findings of Heinz-Ehrlich bodies, or of Howell-Jolly bodies, target cells, and other abnormal elements in the peripheral blood of an infant with known congenital heart disease. Every baby having an obscure type of congenital heart disease should have peripheral blood studies with this syndrome in mind. If there are any of a variety of abnormalities observed in the blood, and particularly if fluoroscopy reveals transposition of the abdominal viscera, ante-mortem diagnosis of this syndrome can be made.

Defective Hemostasis: I. Hemophilia: A Pediatric Review. C. Weihl. Ohio M. J. **51**:983-985 (Oct.) 1955 [Columbus, Ohio].

Hemophilia, one of the classical hematological diseases of childhood, is no longer considered a single disease but a group of closely related diseases. The utilization or conversion of prothrombin into thrombin during the clotting process requires the presence of active thromboplastin in addition to the platelet factor and the tissue thromboplastin factor. Several substances normally present in the plasma contribute to the production of active thromboplastin. These substances have come to be known by several names; a deficiency of any one of them leads to a prolongation of clotting time and the clinical syndrome of hemophilia. The term of plasma thromboplastin factor A (PTF-A) is proposed for one of these substances and the clinical disease that occurs when it is deficient should be called hemophilia A. The other plasma thromboplastin factors, namely PTF-B and PTF-C, may be deficient and responsible for the defective clotting time, and the clinical syndromes caused by their deficiency should be called hemophilia B and hemophilia C. The diagnosis of hemophilia A (classical hemophilia) depends on a history of a characteristic hereditary pattern (sex-linked recessive trait), a finding of persistent bleeding in a male patient, usually beginning early in life, and the demonstration by laboratory means of a deficiency in plasma thromboplastin factor A (PTF-A or antihemophilic globulin). That the defect is caused by an absence of PTF-A is shown by mixing the patient's plasma with normal plasma and observing that the defect is corrected, whereas mixing the patient's plasma with plasma from a patient who is known to have hemophilia A fails to correct the defect. Hemorrhages will occur in spite of the most patient efforts to protect the child from injury. Their treatment requires, in addition to the usual local hemostatic measures, transfusion of fresh or frozen plasma in which the PTF-A, which rapidly deteriorates in blood stored in the fluid state, is retained for relatively long periods. The clinical syndrome caused by a deficiency of PTF-B cannot be distinguished from true hemophilia. It also seems to be inherited as a sex-linked recessive trait, occurring only in male patients. Ordinary laboratory tests again show prolonged clotting and decreased prothrombin consumption. Plasma of a patient with this disease readily corrects the defective clotting of patients with known hemophilia A, and vice versa. Since PTF-B, in contrast to PTF-A, is relatively stable in stored blood and plasma, patients with hemophilia B can be treated with a transfusion of ordinary stored blood. Hemophilia C differs from the A and B varieties in that it is inherited as a dominant trait and affects both males and females. The tendency to bleed is much less pronounced, and hemarthroses are rare. The clotting time may be either normal or prolonged, but impaired prothrombin utilization as in hemophilia A and B is shown by the prothrombin consumption test. Plasma from patients with this disease will correct the defect in clotting observed in patients with PTF-A and PTF-B deficiency, and vice versa. PTF-C, like PTF-B, is relatively stable, so that the patient with hemophilia C may be transfused with stored blood when necessary to promote coagulation.

UROLOGY

Latent Carcinoma of the Bladder. C. I. Cooling. Brit. J. Urol. **27**:221-223 (Sept.) 1955 [Edinburgh, Scotland].

The term latent carcinoma has been employed in cases in which the primary tumor is detected only at postmortem examination or not until after metastases have produced symptoms. The author presents two such cases. The first patient was a 53-year-old woman, who had had a swelling of the neck for about two years. It had increased rapidly in the previous eight months and had caused pain. Examination revealed a large mass of hard lymph nodes in the left supraclavicular fossa. This mass was fixed to the deep structures and was obviously malignant. A biopsy of the mass revealed a highly cellular carcinoma, but no opinion of the possible origin of the tumor could be suggested. Nasopharyngoscopy, bronchoscopy, and gastroscopy were carried out, but all failed to reveal any primary tumor in the accepted common sites of origin for such a metastatic tumor mass. The mass in the neck was treated by x-ray therapy as though it were a primary tumor, and in three months the mass resolved completely. Six months later, edema of the right leg developed and the right kidney became palpable, but the woman refused admission to the hospital for further investigation. A few days later she had a cerebral thrombosis from which she died. Postmortem examination revealed a hard, sessile, nodular tumor of the bladder, 3 cm. in diameter, around the right ureteric orifice, which had infiltrated through the whole thickness of the bladder wall. A chain of involved lymph nodes extended from the iliac vessels to the celiac axis. The second patient, a woman aged 72, complained of a lump on the chest wall. Histological examination after removal of the lump revealed a highly pleomorphic carcinoma, which was thought to be a metastasis from a carcinoma of the breast, but there was no evidence of such a tumor. Two months later, symptoms of frequency of micturition and hematuria led to studies on the urinary tract, which revealed a large tumor of the right wall of the bladder, which had infiltrated out to the pelvic wall. The woman died a month later. Each of these women presented histological evidence of deep infiltration and invasion of both vascular and lymphatic channels.

Hanging Bladder Stones Formed on Unabsorbable Suture and Ligature. J. H. Levack. Brit. J. Urol. **27**:239-241 (Sept.) 1955 [Edinburgh, Scotland].

While innumerable cases have been reported of foreign bodies in the bladder becoming thickly encrusted, no case of hanging stone as found in the two patients presented here could be found in the literature. In the first patient, a woman aged 42, cystoscopy revealed what seemed to be a calcified papilloma hanging from the anterior wall of the bladder. It was seen to be attached by a pedicle to the bladder wall. There was generalized cystitis. Suprapubic cystotomy disclosed that the calculus was attached to the bladder by a nylon suture. Part of this suture was incorporated in the calculus. The rest of the suture, which was buried in the bladder wall, was detached and the whole specimen was removed. The bladder was closed with catgut. Chemical analysis of the stone disclosed that it consisted entirely of phosphates. The history of this woman revealed that, at a sling operation about two years before, the technique of Millin had been followed, and nylon sutures had been used to transfix the two ends of the fascial slings above the bladder neck. One such stitch had eventually broken partly through the bladder wall at its inner surface. The second patient, a 60-year-old man, had undergone a transvesical prostatectomy. After the operation he felt well, but five months later he reported that lately he had had some bladder pain and frequency of micturition. Cystoscopy revealed a small calculus hanging from the scar area on the anterior wall of the bladder. The stone was voided on the day after the cystoscopy, and after that bladder pain and frequency ceased. Inspection of the specimen revealed that a small calculus had formed on a knot of linen thread. This stone also consisted entirely of phosphates. It is surmised that linen thread had been used for hemostasis.

The Male Gonorrhea "Carrier": Report of Seven Cases. J. B. Bittner and G. O. Horne. Brit. J. Ven. Dis. **31:**155-159 (Sept.) 1955 [London, England].

Gonorrhea is apparently becoming a much more innocuous disease in both sexes. The authors call attention to the male gonorrhea "carrier," a man who has the disease and is capable of transmitting it but who has no symptoms or symptoms so slight that they are ignored. Seven such cases were encountered in four years in a venereal disease clinic. The subclinical infection of the carrier can be diagnosed only by very thorough bacteriological investigation. When this condition is suspected, the investigations should include a stained smear and culture of at least one of the following: urethral scraping, urinary threads (if present), centrifuged urine deposit, prostatic secretion, and centrifuged prostatic urine deposit. The likelihood of success will obviously depend on the standard of techniques used, particularly for culturing the gonococcus. If the patient is symptom-free, more than one positive result should be sought if possible before a diagnosis of gonorrhea is made. A gonococcal complement fixation test should always be done in such cases, but this test has certain limitations, and it should not be relied upon for diagnosis. The importance of the male carrier should not be overrated, but in areas in which the incidence of gonorrhea is increasing or is not decreasing rapidly enough as a result of currently used methods of control, the possibility of male carriers contributing to the infectious pool (usually attributed to females) should be considered.

INDUSTRIAL MEDICINE

An Appraisal of Periodic Health Examinations. R. J. Bolt, C. J. Tupper and O. T. Mallery Jr. A. M. A. Arch. Indust. Health **12:**420-426 (Oct.) 1955 [Chicago].

Shortly after World War II, members of the department of medicine and the institute of industrial health of the University of Michigan Medical School and Hospital were approached by certain industrial organizations in the state of Michigan for the purpose of instituting routine annual checkup examinations for the executive personnel of the interested companies. The system adopted consisted of conducting all examinations on an inpatient basis. This was done for the following reasons: 1. It would afford the examinee a satisfactory examination without repeated visits on an outpatient basis. 2. It would afford a much closer physician-patient relationship and allow for the carrying out of indicated special studies. 3. It would allow for the institution of necessary treatment in the hospital and assure more adequate instruction and follow-up. 4. This system would afford an opportunity to evaluate various laboratory and x-ray procedures when employed in the absence of symptoms and aid in establishing the value or lack of value of these tests as screening measures in asymptomatic persons. The various examinations are outlined. They were initiated in 1947 and have continued to the present time. This analysis covers the five year period from July, 1947, to July, 1952. During this period of time, 943 examinations were done on 500 persons; 481 were men and 19 were women. The average age of those examined was 48.6 years, with a range of from 32 to 70 years. Two-thirds of the examinees were between the ages of 40 and 55. On the initial examination, 52% of the 500 persons examined were found to have one or more defects requiring treatment. Of all defects found on the first examination and for which treatment was advised, 69.8% were not known to exist prior to the examination. On subsequent examinations of the same persons, from 12.7% to 20.3% were found to have new abnormalities requiring treatment. The percentage of unknown defects suggested on the basis of the history and physical examinations was 87.7%. The routine and ancillary studies were responsible for the establishment of otherwise unsuspected diagnoses in 12.3% of the 351 defects found requiring treatment. These figures illustrate the fact that adequate histories and physical examinations continue to be the basic elements for success in this type of examination. The percentage of positive x-rays and/or laboratory studies that reveal significant disease in the absence of signs or symptoms is small.

Uranium Mining Operations on the Colorado Plateau. J. D. Torrey and P. W. Jacoe. A. M. A. Arch. Indust. Health **12:**375-377 (Oct.) 1955 [Chicago].

In the mining of uranium on the Colorado Plateau, the occupational hazards are those that could be anticipated, except that the problems are multiplied because of the geographical location, the lack of water, the lack of electrical power, and many other shortages. The evidence obtained in five years of study indicates that in order of their seriousness the occupational hazards are as follows: internal alpha radiation, dust, effects of uranium and vanadium as metals, and miscellaneous hazards. The primary hazard involved in mining uranium arises from the alpha emitters of radon, RaA, and RaC'. The most economical way to control the hazard is by well-planned ventilation. This calls for an engineering study. Inclines, shafts, and stope mines will require different ventilation systems.

THERAPEUTICS

Antagonism Phenomena Between Various Micro-Organisms: Yeasts and Bacteria. M. Bizot. Presse méd. **63:**1251-1252 (Sept. 24) 1955 (In French) [Paris, France].

The simultaneous culture of two micro-organisms in the same medium is usually unfavorable to one of them. In vitro experiments on the antagonisms of yeasts and bacteria showed that the ascosporic yeasts of the Saccharomyces type always inhibit the growth of anascosporic yeasts of the Candida type and of certain bacteria, without significant decrease in vitality. The anascosporic yeasts can inhibit the growth of certain microbes, notably micrococci, but in doing so they undergo some decrease in vitality. This effect, proved in vitro, justifies the time-honored practice of administering brewer's yeast. The phenomenon seems to be linked to the life of the cell, which fact contraindicates the therapeutic use of dead yeasts (powdered or granulated). Ultra-high yeast would appear to be the best therapeutic agent, because its optimum temperature is close to that of the human body and thus permits constant effectiveness in the digestive tract. The anascosporic yeasts are completely inhibited by some germs, such as Proteus, and this inhibition can go to almost total lysis of the yeast. In contrast, Saccharomyces boulardii inhibits the growth of Proteus organisms without decrease in proliferation; the alcoholic action of S. boulardii is not sufficient to explain this inhibition. The coexistence of pathogenic organisms with a therapeutic yeast does not affect its normal development. Theoretically, therefore, its administration is feasible to patients with sepsis.

Erythromycin in Human Brucellosis. O. Urteaga B., P. Larrea R. and J. Calderon M. Antibiotic Med. **1:**513-522 (Sept.) 1955 [New York].

The authors made studies on 14 patients with brucellosis, of whom 7 were in the acute and 7 in the chronic phase of the disease. Erythromycin was administered orally in tablet form, the daily dose of from 1.2 to 2.4 gm. being given in three divided doses. The total dose required to eliminate the febrile attack varied in the acute cases between 20 and 30 gm., administered over a period of from 9 to 16 days, while in the chronic cases, treated according to the biological cycle of the organism, similar results were obtained with small doses of 4.8 to 7.2 gm. administered in two or three days. The authors cite literature reports, which demonstrate that there are two stages of brucellosis that correspond to the life cycle of the Brucella organism—the extracellular bacterial stage and the intracellular rickettsial stage—which have different histobacteriological characteristics and cause the toxifebrile and the apyretic syndromes respectively. The antibiotic acts directly on the organism by making the circulating medium hostile. This suppresses the interstitial reproduction of Brucella and compels the bacteria to take refuge in the cell protoplasm, where antibiotic action is almost nil. In this way the antibiotic destroys the extracellular phase of the organism and the corresponding toxi-infectious syndrome. Then the Brucella enter their defensive intracellular phase and the patient experiences a remission, that is, the apyretic stage. The

characteristic of the organism of being able to multiply in the interstitial mediums, as well as in the interior of the cell, explains the undulant nature of the disease. The antibiotic, which destroys the septicemic bacterial extracellular phase, interferes with the immunity mechanism, and so relapse occurs after variable periods. The authors were able to demonstrate in some of their patients that, by giving erythromycin in smaller doses and only for a few days, the bacterial phase of the disease was controlled and a clinical remission resulted, yet the immunobiological mechanisms were not interfered with. Short relapses again yield to small doses of erythromycin, and the patient's own defense processes are stimulated. Each passage of the organisms from the tissues to the circulating medium acts like an autovaccination that can be controlled by the therapeutic activity of the antibiotic, that is, the antibiotic acts as an adjunct to the patient's autovaccination processes.

Desensitization in Streptomycin Allergy of Nursing Personnel. H. Jahrmärker. Arztl. Wchnschr. **10:**873-876 (Sept. 23) 1955 (In German) [Berlin, Germany].

The author presents the histories of two nurses in whom severe sensitivity to streptomycin developed and in both of whom specific desensitization was carried out. The first nurse had prepared from 30 to 40 streptomycin injections daily and had given inhalation treatments with streptomycin. At the end of five months a conjunctivitis developed, also acute urticaria on face, neck, and arms. A skin test with streptomycin produced a positive reaction, whereas tests with other possible allergens proved negative. Although the symptoms of streptomycin sensitivity subsided after treatment with calcium and histamine preparations, recurrences increased in frequency despite the fact that this nurse no longer prepared the streptomycin injections. Specific desensitization was carried out with the aid of subcutaneous injections of streptomycin. These injections were given two or three times a week, beginning with subthreshold doses that were gradually increased. In the first nurse, a good and persisting tolerance for occupational exposure was obtained. In the second nurse, difficulties were encountered during desensitization. Despite slow increase in the desensitizing doses, the treatment had to be interrupted several times. Furthermore, it proved impossible to confer tolerance for therapeutic doses, which would have been important for an intercurrent tuberculosis. Generally the application of small desensitizing doses is sufficient and safe. Clinical success seems to depend not so much on the size of the doses used for desensitization as on the degree of sensitivity that existed before treatment. The degree of tolerance that can be achieved by desensitization is limited as to dose and differs individually. The immunologic foundations and the technique of desensitization are discussed. If sensitivity to streptomycin becomes severe in nursing personnel in whom symptomatic treatment is not sufficient, either desensitization must be attempted or further contact with streptomycin must be carefully guarded against.

Effect of Cortisone and Certain Other Steroids on the Peripheral Vasculature in Arthritis. A. Woodmansey and J. W. Beattie. Ann. Rheumat. Dis. **14:**293-297 (Sept.) 1955 [London, England].

A defective peripheral circulation is frequently observed in rheumatoid arthritis, and many of the therapeutic measures employed in this and allied conditions result in an increased peripheral blood flow. The authors report investigations on cortisone and certain other steroids. Altogether 57 patients (56 women and 1 man) were studied; 43 had rheumatoid arthritis and 14 osteoarthritis. They were investigated in five groups, each group receiving one of the following steroids: cortisone, testosterone, deoxycorticosterone acetate with ascorbic acid, progesterone, and estradiol monobenzoate. Only one patient, wtih rheumatoid arthritis, received two steroids. Cortisone was the only steroid that consistently produced an improvement in the peripheral vascular status and in the arthritic condition. The peripheral vascular effect may be an important factor in the pharmacological action. It is suggested that this effect of cortisone takes place via the thermo regulatory mechanism.

Trial of Chemotherapy of Myeloid Leukemia by Three New Agents: Demecolcine, Thiocolchicine, and Myleran. J. Bousser and D. Christol. Presse méd. **63:**1229-1231 (Sept. 21) 1955 (In French) [Paris, France].

Six patients with chronic myeloid leukemia were treated with demecolcine (Compound 12,669), a colchicine derivative. This drug has a definite effect on leukocytosis, percentage of immature elements in the blood, and splenomegaly; it can produce excellent remissions, but only at dosage levels at which its effects are not strictly controllable and constant checking is necessary. Accidents occur that are serious and unforeseeable. The results obtained with demecolcine are highly transitory. Another colchicine derivative, N-desacetyl-thio-colchicine (R 261 Roussel) was tried in seven patients with the chronic form of the disease and proved to be similar to demecolcine, in that its activity was so temporary as to require a maintenance program of treatment and its toxicity was pronounced. It may even have contributed to the death of one patient. Myleran, or GT 41 (1-4-dimethylsulphonyl-oxybutane), on the other hand, gave encouraging results in a group of 18 patients, 14 with chronic myeloid leukemia, 2 with terminal myeloblastic attack, and 2 with myeloid splenomegaly with myelosclerosis. This was especially true for the first category and not for the second and third. Myleran is well tolerated if no more than 10 mg. is given per day. The authors usually gave three, sometimes four, 2 mg. tablets a day but reduced this number to two when leukocytosis was moderate (about 50,000 white blood cells per cubic millimeter). The effect of the drug on leukocytosis was progressive and complete, and there were no disturbances of red blood cells or platelets. The quality of the remissions obtained was good, and they seemed to last only a little less time than those induced by radiotherapy. Myleran has the advantage of being inexpensive and easy to administer. This drug is worthy of being used in the current therapy of myeloid leukemia.

Desoxycorticosterone and Salicylates in Treatment of Rheumatic Diseases. L. Schiavetti and F. Ferraris. Riforma med. **69:**901-904 (Aug. 13) 1955 (In Italian) [Naples, Italy].

The antirheumatic effect of a preparation containing desoxycorticosterone acetate (0.0002 gm.), sodium salicylate (0.4 gm), vitamin A (0.005 gm.), and vitamin C (0.2 gm.) was studied in 16 patients with third or fourth stage rheumatoid arthritis, 12 with fibrositis, and 30 with arthrosis. The preparation was given rectally in daily doses of three suppositories for 10 days to the patients of the first group, who had had previous treatments, including cortisone, and to those with fibrositis. The patients with arthrosis were given two suppositories daily for 20 days. The elevated erythrocyte sedimentation rate dropped in all the patients with rheumatoid arthritis, 30% of whom were benefited in their subjective symptoms and 40% in their joint function. The best results were obtained in the patients with fibrositis in whom the subjective and functional symptoms disappeared within one week. As for the third group of patients, the therapy was more effective in those with acute arthrosis than in those with arthrosis of long standing in whom even the subjective symptoms were only slightly influenced. A simultaneous study made on 18 patients with the same clinical pictures, who were given rectally only sodium salicylate and vitamin A in doses equal to, or double, those given the above patients, indicated a less marked antirheumatic activity in general of this combination, an insufficient action on pain and the other rheumatic signs, and a less marked action on the erythrocyte sedimentation rate. The salicylic-steroid combination thus gave results superior to those obtained with salicylates alone. The effect of these two substances administered concurrently is potentiated because of their complementary action on the two phases—that of muscular involvement and that of tissue involvement—of the rheumatic inflammation. Side-effects were practically absent in the patients, which fact was partly due to the presence of the two vitamins in the preparation. The vitamins favor the antirheumatic activity, protect the adrenal glands, and probably favor the peripheral utilization of the hormone present in the preparation.

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Hormonal Treatment of Cancer of Breast. R. Grinberg, L. Jaroslavsky and G. Stutman. Rev. Assoc. méd. argent. **69:**163-166 (June 15-30) 1955 (In Spanish) [Buenos Aires, Argentina].

The treatment of cancer of the breast through modification of the endocrine balance started with surgical and roentgen castration, proceeded with the administration of hormones and, later, with adrenalectomy or a hypophysectomy. Cancer of the breast in its relation to hormones can be divided into the following three groups: (1) tumors related to estrogens, (2) those related to androgens, and (3) those that are independent of either hormone. Tumors related to estrogens improve from administration of androgens or as a result of surgical operations aimed at eliminating production of estrogens. Tumors related to androgens improve from administration of estrogens. No definite treatment for tumors of the independent type has been found. The effect of hormonal treatment on metastases is fairly good for skin or bone metastases, moderately good for lung metastases, and poor for metastases in the brain or in the liver. Failure of the administration of androgens, estrogens, progesterone, and cortisone points out the independent nature of the tumor. The authors conclude that: (1) hormones constitute a useful treatment of cancer of the breast (in many cases in the advanced stage of the disease the results are favorable, although transient); and (2) adrenalectomy and hypophysectomy have prolonged the life of many patients with cancer of the breast in the advanced stage. These operations are grave for the poor condition of the patients in that stage of the disease. They should be replaced in the future by adequate medical treatment. The number of patients with cancer of the breast who do not respond to hormonal treatment is very large. Therefore, further investigations concerning treatment of value for the independent type of cancer of the breast are of importance.

PATHOLOGY

Lower Nephron Nephrosis: I. A Pathogenesis for Degeneration of the Kidney Tubules. C. O. Rice, J. H. Strickler and N. Lufkin. Am. J. Surg. **90:**547-557 (Oct.) 1955 [New York].

Complete electrolyte, water, nitrogen, and caloric balance studies were done on 102 patients who had been operated on for severe major illness. Of the 102 patients, 48 died and autopsies were performed. In 21 of these, degeneration of the kidney tubules was observed, while in 27 no degeneration of the kidney tubules was revealed. Of the 21 patients with degeneration of the kidney tubules, the organic cause for death as indicated by the pathological report was insufficient in 8 (group 1) but the electrolyte studies made during life revealed definite electrolyte imbalance. In 13 patients (group 2) organic disease was found on autopsy, which could have contributed to the development of the disturbance in the electrolyte balance that had been revealed by the electrolyte studies made when the patients were still alive. The remaining 27 patients (group 3) in whom electrolyte imbalance was known not to be present, as illustrated by the blood electrolyte studies or as indicated by history, were chosen selectively as controls; tubular degeneration was not found in any of them on autopsy. In analyzing these three groups, it was observed that an electrolyte imbalance and tubular degeneration of the kidneys were constantly associated regardless of other organic disease. Conversely, when tubular degeneration was not found in the kidneys (group 3), no electrolyte imbalance had existed, as indicated by the history or the laboratory findings. In some of the patients in group 3, the kidneys did not show tubular degeneration, although the disease causing death may have been severe; in others, the short duration of the illness would seem to indicate that an electrolyte imbalance would not have had time to develop. The authors suggest that, when tubular degeneration of the kidney is found on autopsy, electrolyte imbalance may have been present before death. The consistency of these corollary findings, and their absence when an electrolyte imbalance has been known definitely not to exist, suggests the relationship even in the face of other organic disorder. Conversely, when an electrolyte imbalance has existed and has contributed to the death of a patient, it is likely that tubular degeneration of the kidneys will be found. These corollary findings of electrolyte imbalance and degenerative changes in the kidney tubules suggest a pathogenesis for lower nephron nephrosis, the cause of which has long eluded specific identification.

Lower Nephron Nephrosis: II. The Function of the Kidney When Tubular Degeneration Exists. C. O. Rice and J. H. Strickler. Am. J. Surg. **90:**558-561 (Oct.) 1955 [New York].

The electrolyte intake and output figures and serial blood electrolyte pictures in the 21 patients with degeneration of the kidney tubules reported on by the authors in the preceding paper are discussed. Only 3 of the 21 patients had terminal anuria. The tubular degeneration in these three patients was no greater than that observed in the other 18 patients who did not have anuria. On the whole, the excretion of water by the kidneys was found to be only slightly diminished in the patients with severe tubular degeneration. There was no constancy in the nature of the electrolyte imbalance in relation to the extensiveness of the tubular degeneration. The findings, however, indicated a significant decrease in the excretion of sodium and chloride and, to a lesser extent, of potassium and nitrogen when tubular degeneration of the kidneys was present. These findings suggest the need for reducing the intake of these elements in proportion to their excretion in the urine, lest their retention result in further chemical imbalance. In many of the patients who died with tubular degeneration of the kidneys, glycosuria was not present despite the high blood sugar level. These findings made the authors aware of the need for observing and treating an elevated blood sugar level, as well as treating the electrolyte imbalance when these conditions exist simultaneously.

The Severity of Aortic Arteriosclerosis in Certain Diseases: A Necropsy Study. D. L. Creed, W. F. Baird and E. R. Fisher. Am. J. M. Sc. **230:**385-391 (Oct.) 1955 [Philadelphia].

Although the actual mechanism involved in the development of human arteriosclerosis has not been clearly elucidated, the possibility that certain diseases may influence its evolution is suggested by the fact that syphilitic aortitis, diabetes mellitus, xanthomatosis, hypothyroidism, and lipoid nephrosis, as well as hypertension, are often accompanied by severe arteriosclerosis. The authors evaluated the severity of aortic arteriosclerosis found in 1,223 autopsies performed on males at Veterans Administration Hospital during the seven year period from 1946 to 1952 inclusive. The severity of aortic arteriosclerosis was tabulated in each instance according to the major disease accounting for the patient's death as disclosed at autopsy. Only those diseases that appeared to be related to a statistically significant increase or decrease of aortic arteriosclerosis are considered in the results. The data obtained reaffirmed the observations of an increased severity of arteriosclerosis in patients with hypertension. Bronchogenic carcinoma was also associated with such an increase. This appears to be directly associated with this type of malignant tumor, rather than the presence or absence of hypertension or old age in these patients. The rapid weight loss of patients with bronchial carcinoma likewise cannot account for the increased severity of arteriosclerosis, since such alteration in the nutritional state was found also in other neoplastic diseases not associated with comparable degrees of arteriosclerosis. Whether the smoking factor is important in the development of arteriosclerosis cannot be affirmed or refuted. The high incidence of adrenal metastases (45% in this series) in bronchogenic carcinoma might suggest the possible effects of adrenal destruction in the development of human arteriosclerosis. However, similar degrees of arteriosclerosis were noted in patients without adrenal metastases. The degree of arteriosclerosis was decreased rather than increased in patients with Laennec's cirrhosis and in those with malignant lymphoma. The authors feel that an explanation for a decreased severity of arteriosclerosis in patients with hepatic cirrhosis might well reside in the clearing action of estrogen upon serum lipoproteins, failure of estrogen inactivation being a characteristic of Laennec's cirrhosis. In addition, the presence of jaundice, which is associated with in-

creased serum phospholipids, an important factor in the stabilization of serum lipid emulsions, may also play a role. The frequent hepatic involvement observed in patients succumbing to malignant lymphomas and leukemia may account for the decreased severity of arteriosclerosis in patients with these diseases. A prolonged poor nutritional state, which many of these patients exhibit, is also frequently associated with a decreased severity of arteriosclerosis.

Adrenocortical Activity and Reactivity as Measured by Eosinophil Counts. A. Hoffer. Canad. M. A. J. **73:**463-465 (Sept. 15) 1955 [Toronto, Canada].

It is impossible to assay adrenocortical activity and reactivity by means of eosinophil counts unless the total diurnal rhythm is represented. No valid comparison is possible between groups of subjects unless the activities are compared at a time when the rate is not changing, that is, either at the sleeping eosinophil peak or the waking eosinophil trough. The reactivity must be measured by the rate of change of eosinophils.

Rheumatic Activity in Auricular Appendages Removed at Mitral Valvoplasty. R. M. Clark and W. Anderson. Am. J. Path. **31:** 809-820 (Sept.-Oct.) 1955 [Ann Arbor, Mich.].

Seventy-eight auricular appendages from patients with progressive cardiac failure presumably of rheumatic origin were available from valvoplasty procedures performed at the Toronto General Hospital. Since the most recent operation in this particular group was carried out at least 18 months ago, sufficient time has elapsed to report on the incidence of recrudescence and on any relationship that might exist between the reappearance of clinical rheumatic fever and the extent and nature of the auricular lesions encountered. Portions of the 78 auricular appendages were examined microscopically. In only 10 of them were lesions completely absent. Histological evidence of rheumatic activity in the form of Aschoff nodules was found in 50% of the patients, sometimes many years after the initial attack and in the absence of signs of clinical activity. These lesions were almost twice as frequent in patients under 31 years of age as in the remainder of the series. The change observed most frequently was basophilic connective tissue degeneration, which was present in 54% of the cases. The other lesions observed included cellular infiltration in endocardium and myocardium in 51%, fibrosis in 40% and intra-auricular thrombi in 42%. Thrombi were most frequently found in association with auricular fibrillation, but no correlation could be found between Aschoff nodules and arrhythmias. The presence of Aschoff lesions and the postoperative course could not be correlated. Two possibilities are suggested by the fact that granulomas were encountered more frequently in the younger age group. First, the rheumatic process, although subclinical, may be continuously active. Alternatively, the presence of lesions could be explained by recrudescences becoming less frequent with advancing age. According to the clinical histories, rheumatic fever was present in some of these patients from 6 to 41 years before operation. Incidental to the study of the heart material was the study of 29 specimens of lung taken for biopsy. They were examined for parenchymal and vascular changes that might indicate chronic pulmonary hypertension. About one half of the 29 specimens of lung were found to show changes indicative of chronic pulmonary hypertension.

ANESTHESIA

Local Anesthesia in the Newborn. R. E. Straith, J. L. Teasley and L. T. Moore. Plast. & Reconstruct. Surg. **16:**125-134 (Aug.) 1955 [Baltimore].

The authors feel that the correction of congenital deformities such as harelips is too often postponed much longer than necessary. At between 1 and 4 weeks of age a newborn infant, with adequate preoperative medication, can be operated upon under local anesthesia for the correction of these deformities without the danger of general anesthesia. Local anesthesia has five advantages. First, it is much safer than general anesthesia in infants. Second, there is more room about the operative site when anesthesia apparatus is eliminated. Third, there is no disturbance of fluid intake and output, which often leads to serious problems in infants. Fourth, adrenalin, which can be used with the local anesthesia, markedly reduces the blood loss, especially in very vascular tumors. Fifth, local anesthesia is much less expensive. At the Straith Clinic in Detroit, babies with cleft lip and other deformities are operated upon at about 7 days of age. The baby will usually be gaining weight and should weigh at least 6 lb. (2,721.55 gm.), take fluids normally, and have a normal hemoglobin level, temperature, pulse, and respiration. One hour before operation, 2 or 3 oz. of the food formula are given by gavage. Immediately after this, a suppository of pentobarbital sodium (Nembutal) is inserted as far as possible, and the buttocks are taped tightly shut to prevent its being expelled. The child is then returned to the crib until it is brought to the operating room 45 minutes later. The baby is placed on the operating table, with its head in a rolled towel "doughnut" with adhesive passing under the doughnut and around the forehead. The baby is "mummified" with adhesive tape under the back to both wrists and across the hips and knees. The chest is not immobilized, so that, in case of vomiting, the head and chest can be turned to prevent aspiration. After the baby is in proper position for operation, the depth of analgesia is determined by pinching the ear lobe. If there is a response to this stimulus, 4 or 5 mg. of meperidine (Demerol) hydrochloride is injected intramuscularly in a 6 lb. baby. If the response is delayed, but definite, 2 or 3 mg. is given. If there is little or no response, no Demerol is given. Periodic stimulation is used to keep informed as to the baby's analgesia level. Oxygen may be given through the nose but is rarely necessary. In babies with cleft lip, 5 cc. of 1% Xylocaine is injected at each infraorbital foramen, in the base of the columella, around each superior buccal fornix and at the corner of the mouth, and usually gives excellent anesthesia. Several hundred infants with congenital deformities have been operated upon with local anesthesia and some form of sedation without an anesthetic death.

On the Present-Day Therapy of Shock for Surgical Patients. J. S. Lundy. Proc. Staff Meet. Mayo Clin. **30:**446-450 (Oct. 5) 1955 [Rochester, Minn.].

Lundy calls attention to a new factor that must be recognized when shock occurs during anesthesia. When a patient, adult or child, has been treated for some time with either cortisone or corticotropin, and this treatment has been stopped for some time, shock may appear suddenly. This type of shock can be fatal. It should be prevented by the preoperative preparation of such patients with cortisone, and the agent should be given postoperatively as well. Occasionally, a solution of dextran and hydrocortisone seems to maintain the average patient without resort to measures other than the giving of fluids. An equally soluble fluorohydrocortisone has been made available, in which the potency has been increased tenfold, so that 10 mg. of fluorohydrocortisone diluted in 500 cc. of dextrose has been effective. Very recently a preparation of hydrocortisone has been made available that is water-soluble and need not be diluted in more than 2 cc. of water. This preparation can be given in very small quantities. This is convenient and speeds up recovery. When blood has been lost, it should be replaced. However, it may not be necessary to replace all the lost blood. In cases in which surgical shock has occurred, with considerable loss of blood, excellent results have been obtained from first giving 500 cc. of the proper blood, followed by 500 cc. of a 6% solution of dextran in isotonic solution of sodium chloride containing 100 mg. of hydrocortisone. Administration of this solution is followed by the giving of a second bottle of blood, a procedure followed in turn by administration of another bottle of dextran, with or without the hydrocortisone. The author hopes that it will become possible to treat patients prophylactically against shock. He feels that it will probably not harm a patient to give him cortisone preoperatively and to repeat it on the day of operation and again in the first part of the postoperative period.

BOOK REVIEWS

The Practice of Dynamic Psychiatry. By Jules H. Masserman, M.D., Professor of Neurology and Psychiatry, Northwestern University, Chicago. Cloth. $12. Pp. 790. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1955.

Dr. Masserman has always been active in research as well as in clinical activities and, like many other psychiatrists, has developed his own formulation of the nature of emotional illness, which he presents with great facility. This book follows a previous volume called "Principles of Dynamic Psychiatry," in which he elaborated a theory of biodynamics, correlating concepts of behavior into a comprehensive system. Now he includes his theory of Ur-defenses (a group of commonly held beliefs that protect from fear and anxiety) to explain aspects of conduct. Insights gained from animal experiments are also presented. The volume discusses the psychiatric examination and reaction types, although a large portion is devoted to therapy—a wide range of subjects is listed in the index under therapy. There is a chapter that deals with the type of reports that should be presented to medical and nonmedical personnel. A detailed account of the historical background of psychotherapy and chapters on group therapy and musical therapy are features of the book. Many case histories are scattered through the text. The bibliography is extensive and the index adequate. The format is so modern that the headings have no capital letters. The whole text sparkles with mention of history, philosophy, literature, art, and music. There are extensive references to the work of other psychiatrists. This book presents such a personal bias and departs so far from the conventional that it cannot be considered a textbook but will be read largely to learn the author's particular point of view. In general it appears to sacrifice depth and integration to scope. It is recommended for stimulating supplementary reading.

Textbook of Occupational Therapy with Chief Reference to Psychological Medicine. By Eamon N. M. O'Sullivan, B.A., M.B., D.P.M. Cloth. 21s. Pp. 319, with illustrations. H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C.1, England; (printed in Republic of Ireland by Kerryman Ltd., Tralee), 1955.

This book offers a balanced discussion of the practical aspects of occupational therapy. The opening chapter on definitions and history is lively and instructive. Successive chapters deal with general principles, with problems of organization and administration, with the special applications of occupational therapy in mental disease, and with the analysis of representative crafts such as woodworking. The author has gone to much trouble to give concrete details such as floor plans, and the section (beginning with page 67) on occupational opportunities for patients in the kitchen, dining halls, laundry, farm, gardens, grounds, seamstress's department, tradeshops, and engineer's department should be helpful. The many problems in disposing of items made in some occupational therapy are described. There is a good bibliography and an index. This book is recommended.

Systemic Lupus Erythematosus: Review of the Literature and Clinical Analysis of 138 Cases. By A. McGehee Harvey, M.D., and others. Reprinted from *Medicine*, vol. 33, no. 4, December, 1954. Cloth. $3. Pp. 291-437, with 25 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1955.

This monograph from the department of medicine of Johns Hopkins University is the most comprehensive review available of the symptoms, laboratory features, and treatment of systemic lupus erythematosus. Since the concept of this disease has broadened greatly in the last few years with the widespread use of the diagnostic plasma L. E. cell test, such a review is particularly timely. The authors have attempted to gain as complete a picture as possible of the natural history of this disease by analyzing the case histories of 138 patients with systemic lupus erythematosus and by correlating their findings with those in the medical literature. They have analyzed the effects of treatment on each of the manifestations of the disease. The review was compiled with the hope of bringing to light new avenues of approach to the study of lupus erythematosus; however, it should also serve as an excellent reference manual for the investigator and as a differential diagnostic aid for the clinician. Rapid reference is facilitated by the use of a detailed outline in the table of contents. The bibliography is extensive and current. The publishers are fully justified in reprinting this review in the form of a bound volume of good quality.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

Wiederbelebung. Von Prof. Dr. H. Killian und Priv.-Doz. Dr. A. Dönhardt. Cloth. 24 marks; $5.70. Pp. 320, with 93 illustrations. Georg Thieme Verlag, Herdweg 63, (14a) Stuttgart, Germany; [Intercontinental Medical Book Corporation (subsidiary of Grune), 381 Fourth Ave., New York 16], 1955.

The authors of this book appear to be well informed about recent developments in pharmacology and anesthesiology and on this basis offer a thorough discussion of the entire subject of resuscitation. Preliminary chapters on definitions and history are followed by a review of the problems of resuscitation as seen from the viewpoint of gas exchange, cardiovascular regulation, temperature regulation, renal function (especially water and salt balance), the muscular and skeletal system, the psyche, and the autonomic nervous system. In connection with this last, there is a penetrating summary of current thinking about the use of drugs to influence or abolish the regulatory activity of the "vegetivum." This is followed by a substantial chapter on the treatment of apnea, of circulatory failure, of renal failure, and of severe pain. A short section on the transportation of the sick and injured includes several important collections of figures. A concluding section takes up the important varieties of asphyxia, of thermal and electrical injuries, and of injuries seen after atomic bombing. The information in this book is up-to-date and compactly presented. The illustrations are not only attractive but also valuable, since they show details of modern European apparatus. Bibliographies include American and Canadian works, and the index is good. The book should help to correct the unreasonable fear of acapnia that lingers from former days. It should be seen by everyone concerned with emergency work, anesthesia, premature infants, oxygen therapy, and first aid.

Applied Medical Bibliography for Students. By William Dosite Postell, Medical Librarian, Louisiana State University School of Medicine, New Orleans. Publication no. 259, American Lecture Series. Monograph in Bannerstone Division of American Lectures in Internal Medicine, edited by Roscoe L. Pullen, A.B., M.D., F.A.C.P., Professor of Medicine, University of Missouri School of Medicine, Columbia. Cloth. $4.50. Pp. 142, with 12 plates. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1955.

Despite the author's declaration that this book was designed for students, it seems to offer a great deal of useful information for several other types of reader. Part 1, dealing with historical bibliography, gives a condensed account of scientific and medical writing from the time of the Assyrian manuscripts through the beginnings of modern medical journalism in the mid-19th century. Part 2, dealing with modern bibliography, is a survey of medical libraries and their collections and a brief evaluation of a number of basic reference books, indexes to periodical literature, and journal collections, including general and specialty groups. In part 3, which describes methods of bibliography, the author outlines scientific investigation and gives in some detail the process of writing a paper and the techniques of compiling a final bibliography, including the two most commonly used forms of documentation. This little volume has considerable value as a reference tool for the individual researcher and for the small library. The appendix includes a bibliography of the various titles mentioned in the book, as well as a list of recommended readings. It is carefully indexed and is illustrated with reproductions of bibliographic tools such as various types of catalog cards, journal-holding files, and index pages. The author's style is smooth and uncomplicated. The book is highly recommended for libraries or for individual readers, as well as for medical students.

QUERIES AND MINOR NOTES

RECURRENT CARDIAC INFARCTIONS

To the Editor:—*A 35-year-old white man had a posterior myocardial infarction in 1952 followed by an uncomplicated recovery. Four months ago he had an anterior infarction, again with a normal recovery. Both episodes were confirmed by electrocardiograms. At present his tracing shows evidence of only an old anterior infarction. There is nothing to suggest a ventricular aneurysm. A lung x-ray is normal; the cardiothoracic ratio is 16/29.5. He is slightly underweight. His blood pressure and the remainder of his physical examination are normal. This man's only complaint is dyspnea when he lies on his left side, and this is promptly relieved when he changes position. What is the most probable explanation for this symptom? What is the average life expectancy in a case of this kind?* *John M. Trapnell Jr., M.D., Philadelphia.*

Answer.—Regarding this inquiry, the cardiothoracic ratio of 16/29.5 suggests enlargement of the heart; therefore, dyspnea, even when it is only experienced when the patient lies on the left side, possibly suggests heart failure. However, since it apparently is relieved by change in position, extracardiac factors such as an arthritis of the dorsal spine, a hiatus hernia, floating lower rib or ribs, an abnormality of the splenic colon, a "Magenblasse," duodenal or gastric lesion, or even a gallbladder condition must be excluded. A trial of therapy for heart failure, with administration of digitalis and a sodium-restricted diet, might be essayed to see if the symptom is obviated. The average life expectancy in the case of a man with two acute coronary episodes would be from two to five years. A patient who has had three bona fide coronary occlusions is alive now for six years following the last and is apparently in "perfect health." The electrocardiogram still shows deep Q-waves. Another patient with bronchial asthma suffered three bona fide episodes of acute coronary occlusion and survived the last attack almost 10 years.

TUBERCULOSIS IN INFANT

To the Editor.—*What treatment is indicated for an 11-month-old child with a large, firm, nontender cervical node of one month's duration and a positive patch test? Examination otherwise and chest x-ray are negative. The only therapy to date has been antibiotics for one week with no apparent change in the mass. If this should be tuberculous adenitis what therapy would be advised?*

Keith E. Vincent, M.D., Long Beach, Calif.

Answer.—Any 11-month-old child who reacts characteristically to tuberculin has tuberculous lesions that probably are multiple and may be in various parts of the body. Although it would be necessary to recover tubercle bacilli from the large, firm cervical lymph node for exact diagnosis of this particular disease, it is reasonably safe to assume that it is tuberculous and treat it accordingly. Antimicrobial drugs (streptomycin, aminosalicylic acid, and isoniazid) are in common use in such cases. Some prefer isoniazid alone, others prefer isoniazid and aminosalicylic acid, and still others administer all three of the major drugs simultaneously. Each of these drugs has a suppressive effect on tubercle bacilli, and when two are given in combination they may be more effective than either one alone. Moreover, such combinations delay emergence of resistance of tubercle bacilli to drugs. It would hardly be expected that one week of antimicrobial drug administration would result in an appreciable change in the large lymph node. The treatment probably should be continued for at least six months or even a year. If the node shows evidence of breaking down and becoming fluctuant, surgical extirpation would be indicated without interruption of drug administration. The child has other lesions; therefore, the removal of the one now presenting is not a cure for the disease. One or more of the other lesions may evolve to clinical proportions, which may be prevented by antimicrobial drugs. There is now a widespread movement for the administration of antimicrobial drugs to those who have recently converted from nonreactors to reactors to tuberculin without any other finding but the tuberculin reaction. Recent convertors are known to have at least microscopic tuberculous lesions. They are vascular, and the drugs may be expected to reach all tubercle bacilli. It is not yet known whether the bacilli are destroyed or only suppressed. In any event, cases have now been reported in which reversion of the tuberculin reaction has occurred following prolonged drug administration. It is still possible that only suppression has occurred to such a degree that bacilli have not multiplied and therefore tuberculoprotein is not being eliminated in sufficient amount to maintain sensitivity of tissues. However, some evidence has accrued that strongly suggests such treatment of recent tuberculin converters prevents development of acute tuberculous lesions such as meningitis, generalized miliary disease, and pleurisy with effusion.

GREASE GUN INJURIES

To the Editor:—*Recently I had two cases of finger injury caused by penetration of hydraulic oil under high pressure. In one case there was a small laceration of the skin; in the other there was no visible laceration. The latter case proceeded through stages of inflammation, atrophy, and contracture; the finger finally had to be amputated. The other case occurred three weeks ago; the finger is still swollen and inflamed. I presume the inflammation is chemical. Penicillin was not expected to help and did not. Please comment on nature of these oil injuries and their proper management. Have you heard of such cases involving the eye or the male genital organ?* *J. B. Martin, M.D., Fredericktown, Pa.*

Answer.—Grease gun injuries to the hand have been reported a number of times in the literature. (Byrne, J. J.: Grease Gun Injuries, *J. A. M. A.* **125:**405 [June 10] 1944; Frank, E.: Hand and Finger Injuries Caused by Grease Under High Pressure, *Wien. klin. Wchnschr.* **67:23**, 1955; Mason, M. L., and Queen, F. B.: Grease Gun Injuries to Hand, *Quart. Bull. Northwestern Univ. M. School* **15:**122, 1941.) The writer has seen a similar injury of the nose but has seen no report of involvement of the eye or male genitalia. The injury is due to injection under high pressure, (from several hundred pounds up to 1,000 lb.) of lubricating grease from the nozzle of a grease gun. Similar injection of diesel oil may also occur accidentally in mechanics repairing motors. The injection may be quite painless, the finger or hand simply swelling suddenly and becoming numb. The part becomes white or yellowish-brown, and a small pin-point greasy wound is seen. There is often little or no immediate tenderness. Pretty soon, however, areas of gangrene of skin or entire digit occur, and associated with this are evidences of infection. Three factors are accountable for symptoms in this early stage: pressure of the grease, mechanical and chemical irritation of the foreign body, and infection. It would seem logical at this stage to open the digit both to relieve tension and to release as much as possible of the grease. After the initial stage of injury has passed, the grease sets up a chronic inflammatory reaction about the whole extent of the distribution of the grease. This may be extensive, especially if the initial pressure was high or if tendon sheaths and loose fascial spaces are invaded. In this stage it is advisable to dissect out the involved areas, which may require skin excision and replacement. Where residues of oil remain in the tissues, it seems logical to assume that in a certain num-

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

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ber of cases chronic granulomatous lesions (oleomas) will occur; small ones have been encountered by this consultant. These chronic lesions belong to the same generic class as the paraffinomas, the oleomas that followed oil injection of hernias, hemorrhoids, breast plastics, and facial plastics of the past. Similar lesions were reported in the recruits of the German and Russian armies who injected oil beneath the skin to produce tumors for purpose of escaping service.

SYPHILIS AND PAIN IN KNEES

To the Editor:—*A man, aged 52, was found to have syphilis in 1946 and was treated with 10 million units of penicillin. He developed a sensitivity to penicillin and has been unable to receive any since. In 1952, he had pain on the medial aspects of the knees just above and below the joint line and had tenderness over this area. X-rays showed osteoarthritic changes, and an adventitious bursa was removed without relief. The pathologist reported round cell infiltration of the tissue. In 1954, x-rays showed a defect of the tibial plateau and bone adjacent on both tibias. The uric acid level was 5 mg. per 100 cc. A spinal tap was done, and a 4+ Kahn was reported. X-rays taken in May, 1955, showed a healing reaction of the involved areas of the tibia, so that the joint margins were reformed. He has continued to have pain. Colchicine preparations were tried without relief. Should this patient receive further treatment for syphilis, and, if so, should heavy metals be used? At present, neurological examination is negative. Would x-ray findings, such as a defect in the medial tibial plateau that later filled in within a year's time, be caused by syphilis?* *M.D., North Dakota.*

Answer.—The question posed as to the relationship of syphilis to the symmetric difficulty with this patient's knees could hardly be answered without the opportunity to see the patient and his serial x-rays. The description given of the lesions in the knees is compatible with the possible diagnosis of bilateral Charcot neuropathy, and the fact that the patient has had pain does not rule this out. Contrary to the usual textbook statement, Charcot joints are sometimes quite painful. On the other hand, the bilaterality of the lesions and the tendency to spontaneous healing of involved areas of the tibial plateau does not conform to the Charcot joint and renders this diagnosis relatively improbable. The positive Kahn test in the spinal fluid cannot be interpreted. It probably indicates that the patient has neurosyphilis. Flocculation tests on the spinal fluid are, however, relatively unsatisfactory, and, in addition, the information concerning the patient's spinal fluid examination is totally incomplete. One would wish to know the blood cell count, the quantitative protein content, a quantitatively titered complement fixation (not flocculation) test, and a colloidal test. While it seems relatively unlikely that the lesions in the patient's knees are due to syphilis, nevertheless, under the circumstances a therapeutic test is perhaps thoroughly justifiable. Since the patient is known to be penicillin sensitive, such a therapeutic test is probably best carried out with intravenously administered mapharsen, 60 mg., every second or third day to a total of 10 doses, plus 2 to 4 gm. of potassium iodide three times daily (e. g., 1 teaspoonful of the saturated solution given well diluted three times daily after meals). If there is not prompt relief from the pain within a couple of weeks on this treatment regimen, it may be assumed that the lesion is not syphilis. Arsenic plus potassium iodide is better for the purpose indicated than any of the broad-spectrum antibiotics. These have some treponemicidal effect, but this is substantially less than with penicillin or arsenic.

PROTEIN-BOUND SERUM IODINE

To the Editor:—*Kindly indicate corresponding values of basal metabolism tests and protein-bound iodine levels. In other words, a basal metabolism of +20, 30, 40, 50, or 60 corresponds to what iodine level in the blood?*

John P. Gifford, M.D., Vero Beach, Fla.

Answer.—The accepted normal levels of protein-bound serum iodine vary according to the technique employed in their determination but are generally in the range of 3.5 to 8 mcg. per 100 ml. of blood. Fluctuations in readings occur when an attempt is made to exactly reproduce tests of basal metabolic rate; similarly, minimal variations are noted in protein-bound iodine values. Thus, it is not possible to positively interchange these determinations in terms of each other. A severely myxedematous individual might have a protein-bound iodine level of 0.2 to 0.4 mcg.; in the moderate hypothroid state 1 to 2.5 mcg. would be expected, and a moderately severe thyrotoxic patient should present a reading of 10 to 12 mcg. with a corresponding basal metabolic rate of +40 to +60. It should be emphasized that a critical clinical evaluation is the most valuable diagnostic procedure in the determination of the status of any patient suspected of thyroid dysfunction.

CORTISONE SUPPRESSES RESISTANCE TO INFECTION

To the Editor:—*In treating acute rheumatic fever with cortisone acetate in doses of 100 mg. daily the following effects occurred in a 13-year-old boy who has been in bed for one year. On the 21st day an anal ulcer appeared. On the 28th day a tonsillar ulcer appeared. On the 30th day a temperature of 101.4 F (38.5 C) appeared with extensive swelling of the cervical areas bilaterally. This swelling simulated parotitis, which the patient had several years ago. These cervical swellings were indurated and erythematous, and the one on the left side ruptured with a discharge of pus. Before the skin broke there was an eschar 1 in. by 2 in. in area. After this the temperature dropped to 97.4 F (36.3 C). The right cervical swelling fluctuates but is not erythematous or indurated and has no eschar formation. The cortisone acetate therapy was discontinued on the 33rd day. The anal ulcer is healing, and the tonsillar ulcer is gone. It is now 18 days since the patient has had cortisone. The arthritis has gone, and the tachycardia remains at 122 per minute.* *A. G. Walters, M.D., Detroit.*

Answer.—It has been shown that cortisone may suppress resistance to infection. This depression of resistance has been observed in bacterial, viral, and parasitic infections in animals. Acneform eruptions and furunculosis have been reported during hormonal therapy. The use of cortisone in this patient is therefore contraindicated. The history of previous swelling of the cervical glands and the present recurrence of the swelling, with necrosis, ulceration, and purulent discharge is suspicious of tuberculous cervical lymphadenitis. It has been reported that inactive tuberculous foci may be reactivated during hormonal therapy and even after the cessation of treatment. The possibility of the coexistence of tuberculosis with the rheumatic fever should be ruled out.

SUSPECTED CRIMINAL POISONING

To the Editor:—*Blood and urine studies of a patient show the presence of arsenic. There is strong suspicion, albeit no proof, that a criminal attempt at slow poisoning was made. The patient decided not to bring the case into court. Has the physician the duty, or even the right, to make a report contrary to the wish of the patient?* *M.D., New York.*

Answer.—The inquirer does not state the basis for his suspicion of criminal poisoning, but it may be assumed that he has made an adequate investigation to rule out the possibility of accidental poisoning or poisoning in some way related to the occupation of the patient. In some jurisdictions there may be a legal obligation specifically imposed by statute or ordinance on the physician to report to the police a situation involving possible deliberate poisoning. The presence of a small amount of arsenic may be attributed to foods eaten by the patient, but where the quantity exceeds such amounts the possibility of deliberate poisoning may not be ignored. There is undoubtedly a duty placed on the practitioner to protect and save the life of his patient. In the well-known Scottish poisoning case of *Rex v. Pritchard*, Edinburgh, July, 1865, the victim's physician was severely criticized by the judge for his conduct, in that he took no action when he had become convinced that his patient was being poisoned. The judge said that no consideration of professional etiquette could stand in the way of the far higher duty "owed by every right-minded man to his neighbor" to prevent the destruction of human life, in which duty the practitioner

had failed. As a general practice, when criminal poisoning is suspected, the patient should be moved to a hospital where the necessary treatment and investigation can be undertaken. This will protect the patient from the possibility of further poisoning, allow for a more conclusive diagnosis, and afford an opportunity for necessary investigation. Chapter 8, section 1, of the Principles of Medical Ethics points out that physicians as good citizens "should bear their part in enforcing the laws of the community and in sustaining the institutions that advance the interest of humanity." Chapter 1, section 1, similarly states in part that: "The prime object of the medical profession is to render service to humanity. . . ." The fact that a person who is guilty of an attempt at criminal poisoning may in effect be shielded by the physician who fails to call in the authorities to investigate represents a menace not only to the patient involved but to the community at large. The same principle is involved as in the case of a patient having a contagious disease who must be reported for the benefit of the community.

COLOSTOMIES

To the Editor:—*Does the use of an artificial anus on the left side shorten the life span of the patient? In such cases what is the best system to elicit intestinal movements for evacuation? Does the daily use of enemas to clean the large intestine cause atrophy of the peristalsis of the cecum and of the ascending colon? When enemas are used what quantity of water and size of the sound should be used? Is it advisable to use salted water for enemas?* *M.D., Argentina.*

Answer.—A left-sided colostomy in no way shortens the life of a patient, since there is sufficient colon left for normal function. The absorptive aspect of the right colon is not interfered with and enough of the left side of the intestine remains to absorb most of the water and allow for a fairly firm stool. On the question of daily evacuations, a daily enema acts in a cleansing fashion so that usually there are no movements between enemas. Daily enemas do not produce an atrophy of the colon or interfere with any general peristaltic movements. For some patients, an enema every second or third day will control the bowel movements. The amount of the enema varies from about a pint to a quart, depending on what works best for the patient, who rapidly learns how to obtain a good evacuation. Usually a 20 or 22 F. catheter is considered effective to introduce the enema into the colostomy opening, and the distance inserted varies from 10 to 25 cm. Enema water can be plain lukewarm water or slightly soapy water. Some patients with left-sided colostomies get along quite well without enemas. In time the intestine develops a fairly rhythmic function, and bowel movement usually occurs first thing in the morning. There may be two or three small movements during the day, which are readily handled with the modern colostomy apparatus.

PULMONARY FIBROSIS WITH EMPHYSEMA

To the Editor:—*Please describe the management of a case of bilateral pulmonary fibrosis with emphysema, cause undetermined, in a 49-year-old physician in general practice. There is some dyspnea with occasional wheezing, noticeable only on rapid climbing of hills or stairs. Kindly make special reference to: (1) prevention and treatment of respiratory infection, (2) amount and type of exercise, (3) special breathing exercises, and (4) use of bronchodilators and alternatives as iodides and arsenic.* *M.D., North Carolina.*

Answer.—The dyspnea in this patient is probably caused by diffuse airway obstruction, and management should be directed primarily toward keeping the airways open. The extent to which this can be accomplished depends on the mechanism of obstruction that may vary within the broad group of patients who are considered on clinical grounds to be suffering from emphysema. 1. By reducing inflammatory swelling of the bronchial mucosa, antibiotics help to restore patency of the airways when respiratory infection is present. A mixture of organisms is usually involved. Prophylactic use of antibiotics is not indicated unless repeated respiratory infections dominate the clinical picture. 2. Physical exercise up to the point of dyspnea is not contraindicated. 3. Special breathing exercises may be helpful if skilled instruction can be obtained. Such exercises often increase the patient's exercise tolerance and increase his ability to control bouts of dyspnea. 4. Bronchodilators provide the most direct and often the most successful means of relieving airway obstruction with its resultant dyspnea. Iodides and arsenic are not effective alternatives for bronchodilator therapy. Isopropylarterenol and similar agents are conveniently administered with a hand-operated nebulizer. It is important that the patient exhale maximally and then inhale the aerosol deeply so that it can reach the smaller airways. Bronchodilator therapy should be administered freely and, if effective, continued indefinitely.

AUTOPSIES

To the Editor:—*A patient with the probable diagnosis of lupus acutus disseminatus, aplastic anemia, and thrombocytopenia died in a hospital here. The family did not want an autopsy. No charity was involved. Could the coroner and hospital insist on an autopsy or had the wish of the family to be respected?* *M.D., California.*

Answer.—A hospital may request an autopsy but may not have one performed without the consent of the surviving heirs or next of kin. A coroner may insist upon an autopsy in any case coming within his custody within the limits of the statute in the particular state in question. In California, for example, various statutory provisions set forth circumstances under which autopsies may be ordered by the coroner, deputy coroner, justice of the peace, workman's compensation commission, superintendent of public health, and private individuals.

METHOD FOR GIVING THE SALK POLIOMYELITIS VACCINE

To the Editor:—*In* The Journal, *Aug. 13, 1955, page 1406, is a question and answer entitled "Method of Giving the Salk Poliomyelitis Vaccine." I feel that the answer to the question of whether the vaccine should be given by the single-syringe–multiple-needle change method is misleading to the general practitioner. It has been established that the virus of epidemic hepatitis can be transmitted by minimal amounts of blood or tissue juice that will always be present in a syringe if the plunger is drawn back. To recommend not to draw the plunger back is a rather dangerous recommendation in general and certainly not recommendable for the Salk vaccine. Little is known about the immunization, but it is well established that vaccination and immunization given intracutaneously or subcutaneously are far more effective than the intravenous route. Granted that the chances of hitting a blood vessel are minimal, I believe that in a new procedure, such as the Salk vaccination, everybody should strictly adhere to the recommended procedure.*

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GUNSHOT WOUND OF AORTA

To the Editor:—*I would like to comment on "Gunshot Wound of Aorta," Queries and Minor Notes section,* The Journal, *Dec. 11, 1954. One of the points the inquirer wanted to know was whether a .22 caliber bullet striking the abdomen and penetrating the abdominal aorta would stop a man at once. No mention was made by the consultant concerning the hydraulic effect of missiles on the large blood vessels of the body. A missile striking the abdominal aorta can kill instantly by rupturing the aortic valves, bursting blood vessels in the brain, and/or dilating the heart, producing cardiac standstill. It is my opinion that a .22 caliber bullet lacks the momentum to do this unless it is one of the high velocity special makes that several companies put on the market.*

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